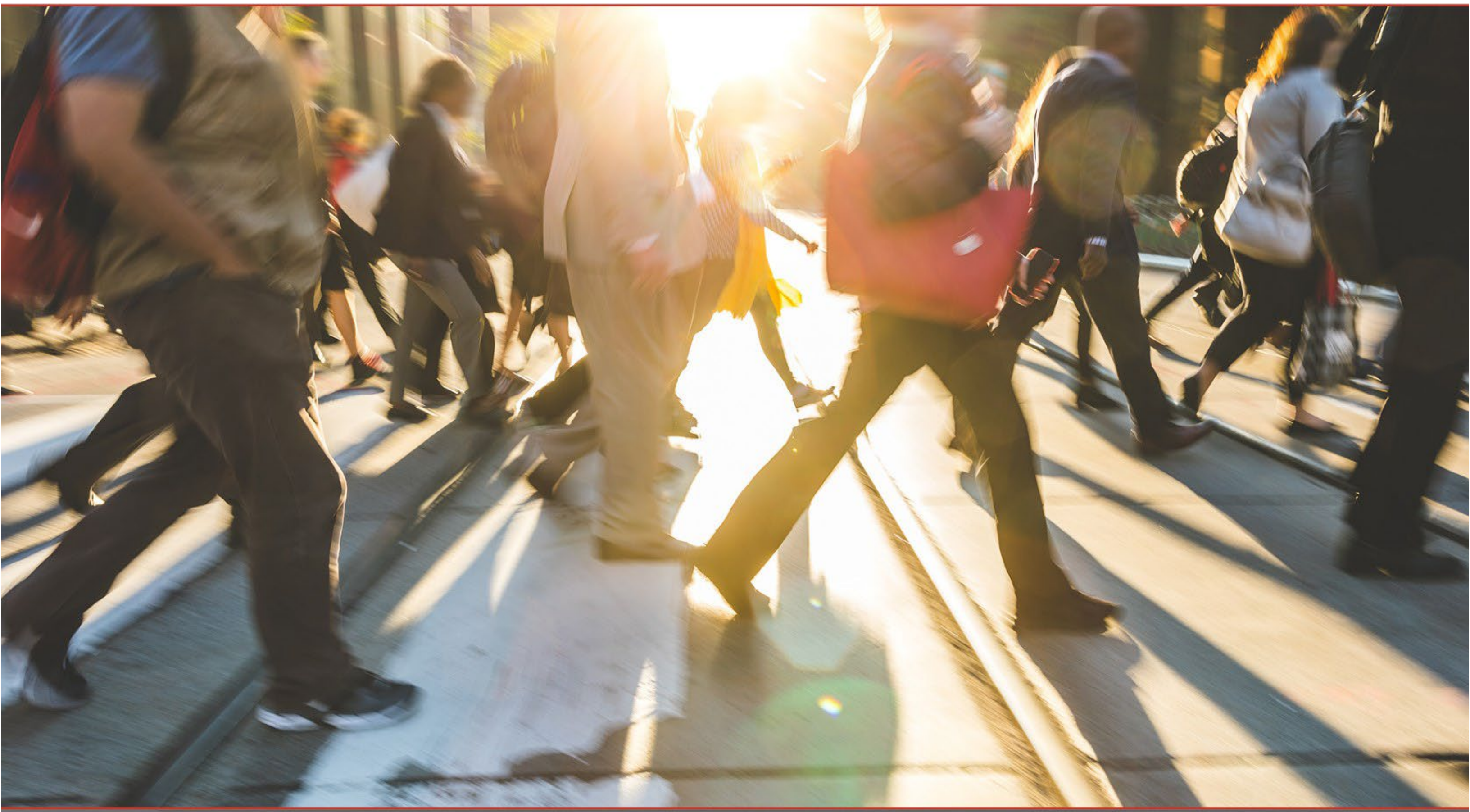
705 KINGSTON ROAD
PROPOSED MIXED-USE DEVELOPMENT

Zoning By-law Amendment Application
City of Pickering



Prepared For: Resident

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AUTHORSHIP

Date	Revision	Update
10/31/2024	Initial Zoning By-law Amendment Application	Final Report

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1.0 INTRODUCTION

BA Group has been retained by Resident (the “applicant”) to provide transportation advisory services for the proposed redevelopment of the lands located at 705 Kingston Road (the “site” or “proposed development”) in the City of Pickering (the “City”) and Region of Durham (the “Region”). This report has been prepared as part of an initial Zoning By-law Amendment (“ZBA”) application being made to the City and Region.

1.1 Site Location and Context

The site is located within the Woodlands neighbourhood and is bounded by Kingston Road to the north, Highway 401 to the south, an existing commercial development (i.e., Michael Boyer Cadillac dealership located at 715 Kingston Road) to the east, and Whites Road and the Highway 401 on-ramp to the west.

The surrounding uses of the site include predominantly retail and commercial uses along the Kingston Road corridor with residential uses immediately north of the Sheppard Avenue corridor (i.e., east-west roadway approximately 365 metres north of Kingston Road, measured centreline-to-centreline). Notably, Kingston Road will undergo a transformation near the site given the planned Durham-Scarborough Bus Rapid Transit line (“Durham-Scarborough BRT” or “DSBRT”), as further discussed in **Section 4.2.2**, and other provincial and municipal policies and initiatives, as further discussed in **Section 3.0**.

The site location is illustrated in **Figure 1**.

1.2 Existing Zoning and Site Conditions

The site is currently occupied by the Whites Road Shopping Centre, comprising two single-storey buildings. The larger building is an “L-shaped” structure operated by various commercial tenants located in the southwest of the property. The smaller building fronts onto Kingston Road and is operated as a food establishment. There are approximately 309 surface parking spaces provided to support the existing buildings. Existing loading facilities are visible to the rear (southern boundary) of the larger building.

Vehicle access to the property is currently provided by two driveways located to the east and west of the site. The west driveway includes a right-in only slip lane providing access for eastbound traffic along Kingston Road. The east driveway provides an all-moves access from a north-south private road (opposite Delta Boulevard) off Kingston Road that is shared and subject to an easement with the neighbouring automobile dealership to the east of the site. The intersection of Kingston Road and the north-south private road / Delta Boulevard is currently signalized.

In addition, the existing uses currently have access to bus services operated by Durham Region Transit (“DRT”) and GO Metrolinx Transit (“GO”), with the closest bus stops located at the intersection of Kingston Road and Whites Road. Pedestrian access is provided by sidewalks along Whites Road and Kingston Road, which connects to a concrete bus pad with an enclosed bus shelter. Bicycle lanes are currently provided along the Kingston Road corridor and bicycle racks are provided at the nearest bus stop.

The site is currently subject to the as-of-right permissions and transportation standards per City of Pickering Zoning By-law 3036 (as amended). The evolving standards of City of Pickering’s Draft Comprehensive Zoning By-law will be incorporated into various transportation-related elements of the development proposal.

The proposed development aims to maintain or improve the existing conditions while considering subject policies per the City of Pickering Official Plan’s Mixed-Use Area (Mixed Corridors) designation, Official Plan Amendment 38 (“OPA 38”), and Kingston Road Corridor and Specialty Retailing Node Intensification Plan (“Kingston Corridor Intensification Plan”), which collectively present a strong redevelopment opportunity given the site’s proximity to existing and new transit services and key destinations accessible by bike ride or on-foot in the area. The transportation-related aspects of the proposed development are presented throughout the following report sections.

1.3 Study Scope

On November 29, 2023, a Pre-Consultation Meeting (PRE 039/23) was held virtually between the applicant, City, and Ministry of Transportation Ontario (“MTO”), to discuss the development proposal concept and submission requirements. City, Region, and MTO staff provided comments following their review in the form of a memorandum received on January 2, 2024, which has been addressed within this report. The consolidated Pre-Consultation Meeting comment document is provided in **Appendix A**.

On March 15, 2024, BA Group circulated a Transportation Impact Study Terms of Reference document to City, Region, and MTO staff for review. Since that time, all agencies have provided comments, which have also been addressed within this report. The Terms of Reference and correspondences are provided in **Appendix B** and Durham Region’s Traffic Impact Study Guidelines are provided in **Appendix C**.

The following outlines the scope of the study:

Development Proposal

- A summary of the development proposal.
- An overview of the site and the surrounding transportation system that provides for automobiles but encourages a shift towards non-automobile travel from prospective residents and visitors while still being able to meet the practical and operational needs of the development proposal.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading, and parking facilities.

Area Context

- A review of the evolving planning context including key provincial and municipal policies, plans, and programs subject to the proposed development.
- A review of existing and future transportation context including key municipal road, transit, pedestrian and cycling changes and other non-automobile dependent travel options in the area.

Site Planning

- A review of the vehicle parking supply requirements and provisions for the proposed development plans.
- A review of the bicycle parking supply requirements and provisions for the proposed development plans.
- A review of the loading space requirements and provisions for the proposed development plans.
- A review of the functionality and appropriateness of the proposed facilities incorporated into the site plan, as applicable, including loading / garbage collection and pick-up / drop-off facility arrangements.
- A review of the functionality of the new public road as part of the proposed development plans.

Transportation Demand Management

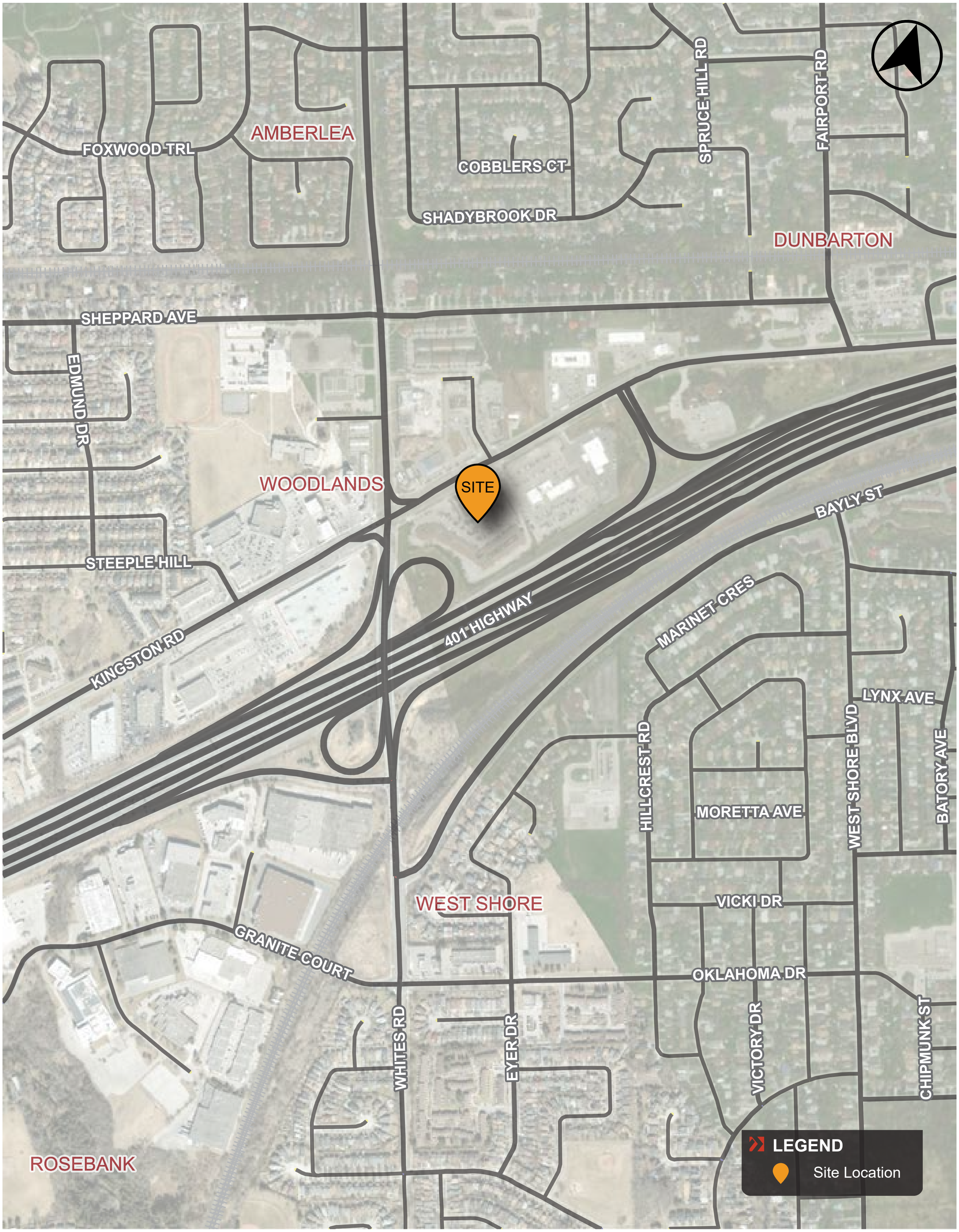
- A review of TDM measures to encourage, facilitate, and support non-automobile travel to/from the site.

Multi-modal Travel Demand Forecasting

- An outline of travel characteristics and travel demand projections for pedestrians, cyclists, transit users and automobile users of the proposed development.
- An assessment of the site-related traffic forecasts for the transit, pedestrians, and cyclists of the proposed development.
- An assessment of the existing vehicle traffic activity patterns and volumes in the study area during the key weekday morning and afternoon peak periods.
- A comprehensive review of the vehicle traffic changes that may occur in the area in the future with the development of several other area development projects.
- A review of existing vehicle site-related traffic activity levels that will be eliminated as part of the proposed development.
- A comparison of the proposed vehicle site-related traffic forecasts to the existing vehicle site-related traffic activity levels generated by the existing site uses today.
- An assessment of the vehicle traffic and other trip generation characteristics of the proposed development.

Traffic Volume and Forecasting Operations Analysis

- A detailed review of the traffic operations at intersections in the area under existing and future traffic conditions including an assessment of the operational impacts of the proposed development.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 1 SITE LOCATION

2.0 DEVELOPMENT PROPOSAL

The development proposal includes a mixed-use development with five (5) building towers comprising 1,748 residential units and 3,922 m^2 of retail gross floor area ("GFA"). The breakdown of proposed uses per building are as follows:

- Building 1: 316 residential units and 1,106 m^2 retail GFA
- Building 2: 376 residential units and 1,683 m^2 retail GFA
- Building 3: 330 residential units
- Building 4: 330 residential units
- Building 5: 330 residential units
- Building 4/5 Podium: 66 residential units and 1,133 m^2 retail GFA

It is proposed to demolish the existing buildings and majority of surface parking as part of the proposed development. The existing eastern access will be maintained with an additional adjacent driveway while the right-in only slip lane along Kingston Road will be removed. In addition, the existing north-south private road will be proposed as a public road to conform to the intent of Official Plan Amendment 38 and Kingston Road Corridor and Specialty Retailing Node Intensification Plan. Moreover, an updated loading strategy for the new buildings will be proposed as part of the redevelopment of the property.

The development proposal including the land use and transportation elements of the site are outlined in **Table 1**. The current site plan is illustrated in **Figure 2** and reduced scale architectural plans are provided in **Appendix D**.

Table 1 Development Proposal Summary

Type	Initial ZBA Submission[1]
Residential Units	1,748 units
Retail GFA	3,922 m^2
Site Driveway	Two accesses from the new north-south public road off Kingston Road
Vehicle Parking Supply	1,138 resident spaces (including 10 accessible spaces) 350 non-resident spaces (including 9 accessible spaces) 1,488 total spaces (including 19 accessible spaces)
Vehicle Parking Access	At-grade parking area from accesses off the new north-south public road, below-grade ramp between Buildings 1 and 2, and below-grade and above-grade ramps at Building 3
Bicycle Parking Supply	880 long-term spaces 176 short-term spaces 1,056 total spaces
Bicycle Parking Access	At-grade bicycle facility from access off the new north-south public road and elevators at buildings lobbies
Pedestrian Access	Building entrances along Kingston Road and from internal pathways
Loading Supply	5 loading spaces
Loading Access	At-grade loading area from access off the new north-south public road off Kingston Road
Pick-up / Drop-off Supply	12 spaces
Pick-up / Drop-off Access	At-grade short-term parking spaces and pick-up / drop-off loop near building entrances from access off the new north-south public road off Kingston Road

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.

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FIGURE 2 SITE PLAN

3.0 PLANNING AND POLICY CONTEXT

3.1 Provincial and Regional Policies

There are several provincial and regional policies and plans relevant to the site from a transportation perspective, including the following:

- Cutting Red Tape To Build More Homes Act, 2024 (Bill 185);
- Provincial Planning Statement (2024);
- Metrolinx 2041 Regional Transportation Plan (2018);
- Envision Durham (2024);
- Durham Regional Transportation Master Plan (2017) and
- Durham Regional Cycling Plan (2021).

The key transportation details of these policy documents are summarized below.

3.1.1 “Cutting Red Tape to Build More Homes Act, 2024” (Bill 185)

The Provincial government introduced the “Bill 185, Cutting Red Tape to Build More Homes Act, 2024” on April 10, 2024, with the goal of increasing housing and infrastructure development in Ontario. As it relates to transportation, Bill 185 includes changes to prohibit and / or limit the ability for municipal Official Plans and Zoning By-laws to require that an owner provides parking facilities (other than bicycle parking facilities) in Protected Major Transit Station Areas (“PMTSAs”) and areas around most major transit stations. Ultimately, this change was made to accelerate new housing development, making it cheaper to build and buy homes near rapid transit stations.

The Provincial Planning Statement (2024), discussed further in **Section 3.1.2**, defines a Major Transit Station Area (“MTSA”) as the area generally within an approximate 500 to 800-metre radius of an existing or planned higher order transit station or stop. A PMTSA is a subset of MTSAs where specific Official Plan policies may be applied.

Overall, Bill 185 received Royal Assent on June 6, 2024, and is now in force and effect. Although municipalities in Durham Region have identified MTSAs which are awaiting ministerial approval, they currently are limited to areas surrounding existing GO stations. The closest MTSA to the site is the Pickering GO PMTSA, which is located approximately 2.5 kilometres or a 15-minute bus ride from the site. Although the site is not located directly within an MTSA, there is potential for the City to expands it’s MTSA zones to consider areas with future rapid transit access (e.g., along the Durham-Scarborough BRT corridor where the site is located).

3.1.2 Provincial Planning Statement (2024)

The Provincial Planning Statement (“PPS 2024”), released in 2024, provides a set of adapted and integrated land use planning policies from the former Provincial Policy Statement (“PPS 2020”) and the former Growth Plan for the GGH (“Growth Plan”), ultimately replacing both documents to form a new provincial planning policy tool. The PPS 2024 aims to further leverage several policies to provide a streamlined land use planning policy framework. In particular, the PPS 2024 builds upon housing-supportive policies from both the PPS 2020 and the Growth Plan to provide municipalities with additional tools and flexibility to build more homes.

Chapter 2 (Building Homes, Sustaining Strong and Competitive Communities) and Chapter 3 (Infrastructure and Facilities) of the PPS 2024 contain transportation-related policies most relevant to the proposed development. As it relates to transportation, Chapter 2 emphasizes the Province's focus on accommodating multi-modal access, requiring transit-supportive development, planning for intensification adjacent to existing and planned frequent transit corridors, and reducing greenhouse gas emissions through transit-supportive communities and active transportation.

Further, Chapter 3 presents several policies related to providing safe and energy efficient transportation systems that can appropriately address projected needs in the Province. Policies therein focus on promoting healthy and active communities through facilitating active transportation, planning public streets to meet the needs of all ages and abilities, providing opportunities for convenient public access to recreational areas, and making efficient use of existing and planning infrastructure through TDM strategies.

The site development as planned, aligns with the policy directions of the PPS 2024 from a transportation perspective by virtue of the site location relative to existing higher-order and surface transit infrastructure / services, and the proposed transportation elements of the plan (e.g., reduced parking standards and active transportation connections / facilities). This policy background is strongly supportive of the proposed development from a transportation perspective.

The PPS 2024 came into force and effect on October 20, 2024, thereby replacing the PPS 2020 and the Growth Plan.

3.1.3 Metrolinx 2041 Regional Transportation Plan (2018)

The Metrolinx 2041 Regional Transportation Plan ("2041 RTP"), adopted in 2018 as an update to The Big Move (2008), directs the continued development of the Greater Toronto and Hamilton Area's transportation network with the goals to create a sustainable system that provides strong connections, complete travel experiences, and healthy and complete communities.

A key strategy of the plan is the integration of transit and land use by promoting high-density, mixed-use development along major transit corridors. As well, embedding TDM strategies in land use planning and development to prioritize cycling, walking, and transit use is highlighted in the Plan. The current development programme aligns with the strategies of the 2041 RTP as it proposes increased residential density along a rapid transit corridor and various TDM strategies which seek to increase encourage travel via transit and active transportation over private automobile.

Beyond these strategies, the 2041 RTP also identifies various transportation improvement projects adjacent to the site that will directly benefit future site users. The 2041 RTP acknowledges that planning is currently underway for the Durham-Scarborough BRT, an upgrade of the existing DRT Pulse bus service along Highway 2 (including Kingston Road). As well, a potential Priority Bus service is proposed along Whites Road between Highway 407 and Pickering GO Station. Priority Bus corridors are intended to bring fast, frequent, and cost-effective transit to parts of the Region that have not yet developed the density or ridership needed to support subway, LRT, or BRT service. These buses will run in mixed traffic with various transit priority measures to ensure they can still run quickly and reliably.

3.1.4 Envision Durham (2024)

Envision Durham, the new Regional Official Plan ("new ROP"), is aimed at effectively managing the growth and development of Durham Region to accommodate 1.3 million residents and 460,000 jobs by the year 2051. Durham Regional Council adopted the new Durham ROP in May 2023 while the Minister of Municipal Affairs and Housing approved Envision Durham, in part, with modifications in September 2024 and is now in force and effect. As such, work on a consolidated version of the new ROP is currently underway and supersedes the 2020 Durham ROP.

Map 1 (Regional Structure - Urban & Rural Systems) of the new ROP indicates that the site is located along a Regional Corridor (Whites Road) and a Rapid Transit Corridor (Kingston Road), the highest order Regional Corridor. Both corridors are a type of Strategic Growth Area identified by the Region which represent optimal locations for prioritizing intensification and higher density mixed-use development. Generally, development along these corridors should be multi-storey, compact, pedestrian-friendly, and transit supportive, similar to the current development proposal.

Further, Map 3A (Transit Priority Network) identifies Kingston Road as part of the Region's Rapid Transit Spine and Whites Road as part of the Region's High-Frequency Transit Network. According to Map 3E (Regional Right-of-Way Requirements) of the new ROP, an ultimate width of 45 metres is reserved on Kingston Road to accommodate the Region's future Rapid Transit Spine (i.e., DSBRT), and an ultimate width of 45 metres is reserved on Whites Road for planned High Occupancy Vehicle ("HOV") or bus lanes. Further details regarding these future transit improvement projects are provide in **Section 4.2.2**. Overall, these findings suggest that the site location is a strong candidate for the proposed transit-supportive, high-density development programme.

Further to these site-specific policies, the new ROP seeks to support and increase the use of non-auto modes of travel throughout the Region. The new ROP includes policies which direct municipalities to encourage walkable, transit-oriented communities where active forms of mobility are safe, viable, and attractive so residents have a range of transportation options to meet their daily needs. Moreover, the new ROP emphasizes the importance of locating high-density, compact development near existing and future transit services and investing in facilities for non-automobile uses (e.g., trails, walkways, pick-up/drop-off facilities). In addition, the new ROP supports the use of TDM strategies to reduce single-occupant vehicle travel, including but not limited to reduced parking standards in appropriate locations. For example, municipalities may consider minimum and maximum parking requirements that reflect the walking distance to transit and complementary uses. The site's location along a future rapid transit corridor and reduced parking supply, supported by a comprehensive TDM plan, align with the transportation-related goals of the new ROP.

3.1.5 Durham Region Transportation Master Plan (2017)

Durham Region's current Transportation Master Plan ("TMP") was completed in 2017 to serve as a strategic planning document to manage Durham's anticipated transportation demands beyond the year 2031. The TMP plays a crucial role in supporting the development initiatives specified in the ROP. Specifically, the TMP is a multi-modal plan that looks at all modes of transportation, including walking, cycling, public transit, auto, and goods movement.

The TMP is anchored by seven (7) key directions, including direction to strengthen the bond between land use and transportation and direction to promote sustainable travel choices such as walking and cycling. Overall, these guidelines aim to enhance connectivity within the Region's transportation network and provide improved options for transit, walking, and cycling.

The TMP highlights various transportation initiatives within the vicinity of the site. Notably, the TMP recognizes that the DRT's current PULSE rapid, high-frequency service on Highway 2 has been very successful, and sets the stage for further BRT investments. As such, Highway 2, including Kingston Road adjacent to the site, is proposed as a Rapid Transit corridor with exclusive lanes from the Toronto-Pickering boundary to Simcoe Street.

The recommended approach for the corridor is to implement DSBRT in dedicated median lanes, however, the ultimate configuration and phasing of the DSBRT on Highway 2 will require further study. Additionally, headways of approximately 5-minutes could be achieved by 2031. Overall, the Highway 2 Rapid Transit corridor will be an important anchor of the Region's Higher Order Transit Network by 2031. It is also noted that High Frequency Bus corridors in HOV lanes will support the Highway 2 Rapid Transit corridor along various roadways, including along Whites Road (from Bayly Street to Highway 407) and Bayly Street in proximity of the site. Along Whites Road, it is also proposed to widen the Right-of-Way (ROW) from five (5) to six (6) lanes between Kingston Road in the south and Finch Avenue in the north, with phasing recommended between 2022 and 2026.

3.1.6 Durham Regional Cycling Plan (2021)

In October 2021, Region of Durham Council approved the Regional Cycling Plan 2021 (“RCP 2021”), a strategic document designed to facilitate a comprehensive cycling network in the Region of Durham. Within this framework, a “Primary Cycling Network” is defined along with a set of recommended infrastructure improvements, timeline considerations, and design applications. Durham Region’s Primary Cycling Network (“PCN”) represents a focused and refined system of cycling routes within the Region, with a specific emphasis on serving key travel destinations.

In the RCP 2021, both Kingston Road and Whites Road (i.e., the site’s adjacent roadways) play integral roles as planned components of the PCN, as depicted in Figure 4-3 (Existing, Planned and Revised PCN Routes). Overall, the RCP 2021 showcases the Region’s plans to improve cycling connections across Durham Region, including connectivity to / from the proposed development.

3.2 Local Municipal Policies

There are several current and proposed local municipal policy documents applicable to the site, including the following:

- City of Pickering Official Plan, Edition 9 (2022) and Official Plan Amendment 38 (2022);
- Kingston Road Corridor and Specialty Retailing Node Intensification Plan (2019) and Draft Urban Design Guidelines (2019);
- City of Pickering Integrated Transportation Master Plan (2021); and
- City of Pickering Integrated Sustainable Design Standards (2022).

3.2.1 City of Pickering Official Plan, Edition 9 (2022)

The City of Pickering Official Plan ("OP") aims to implement provincial and regional directions, as identified above, and lays out the foundation for community building in the City of Pickering. The OP intends to implement the vision for Pickering, ensuring the City is built in a manner that meets the evolving needs of its people, sustains healthy settings, and creates a well-connected social and physical environment. The latest consolidation of the Pickering Official Plan (Edition 9) is dated March 2022. It is noted that the City is in the process of reviewing and updating their OP. Currently, the City is in Phase 1 of this process, conducing background and research. During this time, the 2022 OP is considered in force and effect.

As per the OP, Kingston Road (i.e., the roadway adjacent to the site), is intended to be developed and promoted as the "main street" of Pickering. In specific neighbourhoods in the City, outside of the City Centre, there are guidelines which apply to the development of the Kingston Road Corridor known as the "Kingston Road Corridor Development Guidelines", discussed further in **Section 3.2.2**. Furthermore, a series of land use designations are provided on Schedule I (Land Use Structure Maps), wherein the site is designated "Mixed Corridors", a subcategory of the "Mixed Use Areas" land use designation. According to the OP, development in Mixed Corridors should be designed to be pedestrian and transit friendly from the outset, promoting a vibrant and safe street-life to support the early provision of transit.

Furthermore, as it relates to transportation, the OP includes policies that emphasize the City's intention to reduce reliance on private automobiles in favour of other modes of travel, including walking, cycling and using public transit. For example, the OP states that land use development in the City should support compact urban form, active transportation, and public transit, including consideration for a reduction in vehicular parking spaces where TDM strategies are provided. Overall, TDM initiatives, such as those proposed for the site in **Section 9.0**, should reduce traffic peaks and shift modes away from single occupancy vehicles. Overall, the proposed development aligns with the goals of the Pickering OP as it locates new residential density along a future transit corridor and reduces auto-dependency through an appropriate vehicular parking supply and a TDM plan intended to improve pedestrian and cycling connectivity.

3.2.2 Official Plan Amendment 38 (2022)

The City's OPA 38 was granted Regional approval in November 2022 to revise and add new policies and land use designations to reflect the Council-endorsed Kingston Road Corridor and Specialty Retailing Node Intensification Plan and Urban Design Guidelines, discussed further in **Section 3.2.3 and Section 3.2.4**. OPA 38 ensures the Pickering OP includes the most up-to-date vision and guidelines to support the anticipated population and employment growth within this area. Although the Region of Durham Council granted approval to OPA 38 on November 4, 2022, it is currently under appeal at the Ontario Land Tribunal ("OLT").

As it relates to the site, OPA 38 includes a new chapter into the Pickering OP, Chapter 11A, dedicated to the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas and includes designations for various precincts. The site is located within the White Precinct Intensification Area in a “Mixed Use Type A” area, which is intended to have the greatest density and intensity of uses. Within the Whites Precinct Intensification Area, a “Gateway” is proposed at the intersection of Kingston Road and Whites Road near the site. A raised cycle track on both sides of Kingston Road is also proposed with an enhanced tree and landscaped planting area, wherever possible. Notably, OPA 38 proposes a public north-south road opposite Delta Boulevard with cycling facilities. Additional east-west private road connections are also proposed to enhance midblock connections within the immediate area. The proposed development generally satisfies these requirements from a transportation perspective.

3.2.3 Kingston Road Corridor and Specialty Retailing Node Intensification Plan (2019)

The Kingston Corridor Intensification Plan was endorsed in principle by City Council in 2019 following extensive consultation and studies involving City and Regional staff and relevant stakeholders. The purpose of this Plan was to provide a guiding vision and framework for intensification and redevelopment along the Kingston Road Corridor as a sustainable, walkable, livable, and transit-supportive corridor with a high-density mix of uses including shopping and office uses.

As identified in the Plan, the site is located within the Whites Precinct which is expected to act as a secondary higher density node with a pedestrian-oriented public realm. As well, development within this Precinct is recommended to host a combination of high-rise and retail elements, facilitating a mixed-use environment. The proposed development programme incorporates a mix of residential and retail uses, aligning with the Plan’s vision for the Whites Precinct area. Importantly, the Plan acknowledges strategic capital projects, such as the Durham-Scarborough BRT, as instrumental in enhancing connectivity across the Corridor and reducing auto travel within the designated Precincts.

The Intensification Plan informs the policy and land use designation changes reflected in OPA 38, discussed in **Section 3.2.2**.

3.2.4 Kingston Road Corridor and Specialty Retailing Node Draft Urban Design Guidelines (2019)

The Kingston Corridor Intensification Plan, as discussed in **Section 3.2.3**, is supported by a set of Urban Design Guidelines referred to as the Kingston Road Corridor and Specialty Retailing Node Draft Urban Design Guidelines (“UDG”). The purpose of the UDG is to set out specific design considerations for the Kingston Road Corridor, including built form elements, place-making principles, and transportation (e.g., street) design.

The Whites Precinct, centered around the major gateway intersection of Kingston Road and Whites Road, is envisioned as an employment and retail hub, complete with pedestrian-oriented public realm improvements. Importantly, the UDG supports the integration of transit into the surrounding streetscape. The guidelines explicitly acknowledge the future Durham-Scarborough BRT stop on Kingston Road at Whites Road (adjacent to the site), emphasizing the need for the protection of these designated stop locations. Furthermore, the guidelines anticipate the presence of future High-Frequency Transit on Whites Road, a system that may incorporate HOV lanes, transit signal priority at major intersections, and peak period headways with intervals ranging from 5 to 10 minutes. As well, it is proposed for all of Kingston Road, within the study area, to include cycling infrastructure along both sides of the roadway.

The Urban Design Guidelines informs the policy and land use designation changes reflected in OPA 38, discussed in **Section 3.2.2**.

3.2.5 City of Pickering Integrated Transportation Master Plan (2021)

The City of Pickering's Integrated Transportation Master Plan ("ITMP") was completed in 2021 to serve as a roadmap for establishing a well-balanced transportation system for the future needs and development in the City to 2031. As Pickering's first comprehensive transportation plan, the ITMP represents a long-term, strategic framework that guides the transportation policies, programs, and infrastructure within the City based on four pillars: a safe, well-connected transportation system, inclusive mobility, complete and sustainable communities, and economic growth. Specifically, the ITMP ensures the City's transportation system can meet the needs of all road users, including pedestrians, cyclists, transit users, and motorists., applying a "Complete Streets" approach.

A key component of the ITMP focuses on growing active transportation in the City to alleviate pressure on the existing transportation network. Three (3) major objectives are identified for active transportation planning in the City, including connecting, upgrading, and expanding the network as well as creating pedestrian- and cyclist-friendly destinations. Map 3 (Long-Term Cycling Network) of the ITMP identifies new cycling infrastructure along Kingston Road, Whites Road, and Bayly Street, near the site, discussed further in **Section 4.4**.

Furthermore, to realize the transportation vision of the ITMP, the City has also identified supporting strategies including greater focus on TDM measures to reduce travel by single-occupancy vehicles and right-sizing parking. The ITMP acknowledges that Pickering's parking supply is already abundant, which, left unmanaged, will make it more challenging to encourage the use of transit and active transportation.

The ITMP additionally recognizes the critical role of public transit in the City's overall transportation system. In Pickering, bus rapid transit is underway on Kingston Road adjacent to the site, and frequent transit is proposed on Whites Road within the vicinity of the site. As such, Map 1 (Long-Term Road Network) highlights road widening initiatives for bus lanes on Kingston Road and the expansion of Whites Road to six (6) or seven (7) lanes to accommodate a High-Occupancy Vehicle (HOV) lane.

Additionally, the ITMP recommends the following actions:

- Planning for higher-density and transit-supportive land uses areas well-served by transit;
- Prioritizing the infill of sidewalk gaps and safe crossing opportunities along transit corridors; and
- Reduced parking rates for development in proximity to higher-order transit.

In summary, the proposed development considers the existing and future transportation conditions within the immediate area and helps the City achieve the goals set out in the ITMP by integrating transit-supportive design principles in the site design that reflect its context within the City's transportation network.

3.2.6 City of Pickering Integrated Sustainable Design Standards (2022)

The City of Pickering introduced the Integrated Sustainable Design Standards ("ISDS") in 2022, replacing the previous 2007 Sustainable Development Guidelines. These newly adopted standards are now mandatory for Draft Plans of Subdivision, Site Plans, and Rezoning applications, and include specific criteria for different development types. The "Mid to High-Rise Residential & Non-Residential Checklist" is applicable to the site. Among its requirements are transportation-related measures, such as requirements for EV rough-in and EV ready charging infrastructure and bicycle parking and storage facilities. There are two tiers of Performance Criteria in the ISDS, with Tier 1 being mandatory for all development application, including the site.

4.0 AREA TRANSPORTATION CONTEXT

4.1 Road Network

4.1.1 Existing Road Context

The site is well-located relative to major roadway connections provided across the City and the Region. Highway 401 and Kingston Road provide the site with strong east-west connectivity, while Whites Road provides the site with strong north-south connectivity.

The area street network within the site vicinity is summarized in **Table 2** and illustrated on **Figure 3**. As well, the existing lane control and traffic configuration for the site area is illustrated in **Figure 4**.

Table 2 Existing Road Network

Road Name	Road Type	Cross-Section Near Site	Parking Regulations Near Site	Description
Highway 401	Expressway	16-lane cross-section (8 lanes in each direction)	Parking is not permitted on either side of the roadway.	Highway 401, governed by the MTO, extends east-west between Windsor in the west and the Ontario-Quebec border in the east. The posted speed limit is 100 km/h.
Kingston Road	Type B Arterial	East of Delta Boulevard: 4-lane cross-section (2 lanes in each direction with dedicated turn lanes at key intersections) West of Delta Boulevard: 6-lane cross-section (2 vehicular lanes and 1 dedicated bus lane in each direction with dedicated turn lanes at key intersections)	Parking is not permitted on either side of the roadway.	Kingston Road, under the jurisdiction of Durham Region, extends east-west throughout the City of Pickering, between the Toronto border in the west to the Ajax border in the east. Bike lanes are provided, generally curbside, along both sides of the roadway near the site vicinity. The posted speed limit is 60 km/h. **Exhibit 1** illustrates the existing condition of Kingston Road dated October 24, 2024.
Whites Road	Type A Arterial	4-lane cross-section (2 lanes in each direction with dedicated turn lanes at key intersections)	Parking is not permitted on either side of the roadway.	White Road, under the jurisdiction of Durham Region, extends north-south between Broadgreen Street in the south and Taunton Road in the north. This roadway provides access to Highway 401, with an interchange located south of Kingston Road. The posted speed limit is 60 km/h.

Road Name	Road Type	Cross-Section Near Site	Parking Regulations Near Site	Description
Delta Boulevard	Local	2-lane cross-section (1 lane in each direction with dedicated left-turn lane at the intersection with Kingston Road)	Parking is permitted approximately 100 metres north of Kingston Road.	Delta Boulevard, under the jurisdiction of the City of Pickering, extends north-south between Kingston Road in the south and a cul-de-sac approximately 150 metres north of Kingston Road. The assumed (unposted) speed limit is 50 km/h. **Exhibit 2** illustrates the existing condition of Delta Boulevard dated October 24, 2024.

Exhibit 1: Kingston Road at Delta Boulevard (Facing West)
Source: BA Group (October 24, 2024)

Exhibit 2: Delta Boulevard at Kingston Road (Facing South)
Source: BA Group (October 24, 2024)

Exhibit 3: North-South Private Road at Kingston Road (Facing North)
Source: BA Group (October 24, 2024)

4.1.2 Proposed Road Network

4.1.2.1 PICKERING OFFICIAL PLAN AMENDMENT 38

As noted in OPA 38 and the Kingston Corridor Intensification Plan, the proposed development will support the delivery of a new north-south public road (currently a private access road), which will extend south from Kingston Road to its terminus as a cul-de-sac. The public road is adjacent to the proposed on-site urban park, further discussed in **Section 10.2**, and is aligned with the existing Delta Boulevard connection, which currently terminates at Kingston Road.

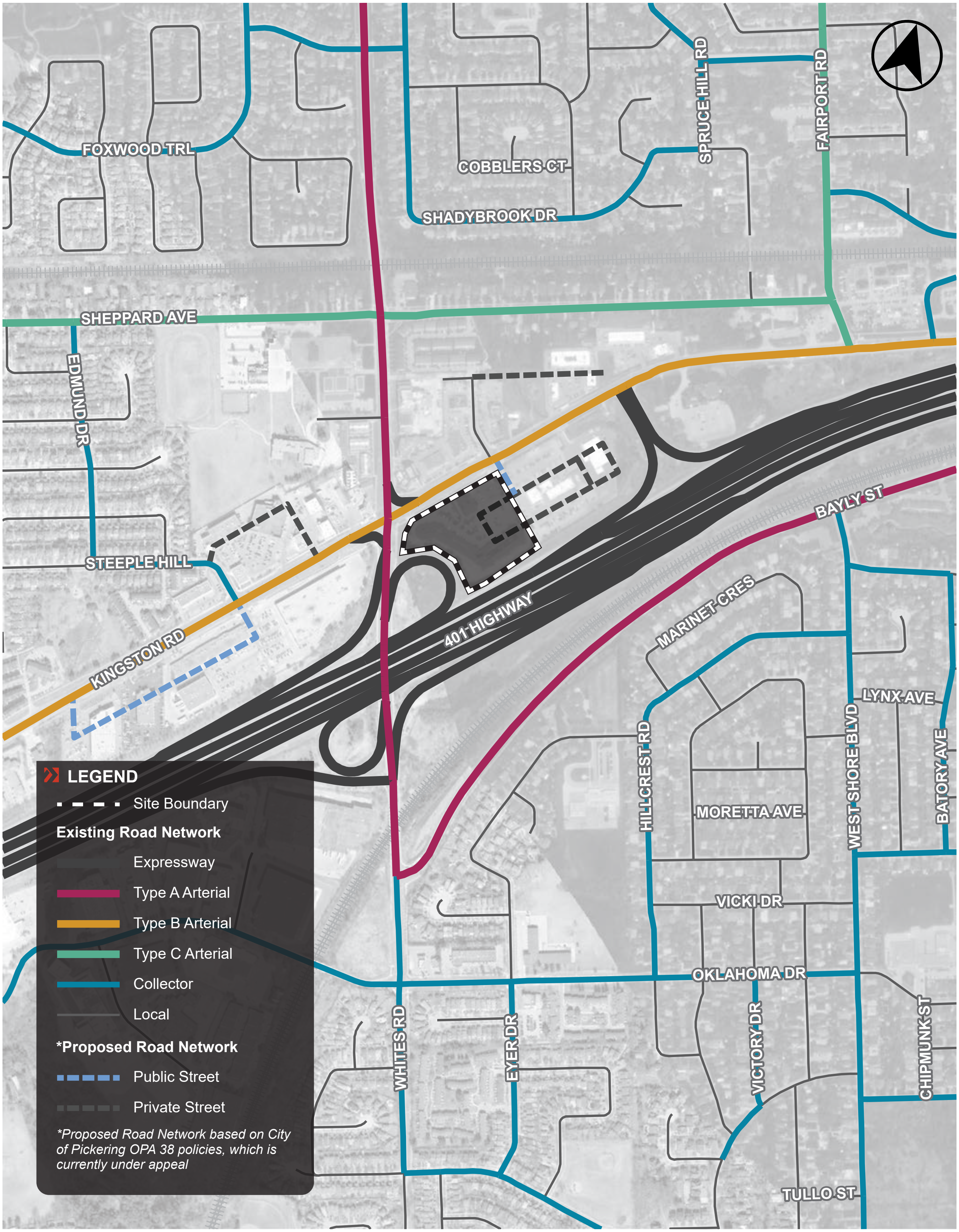
4.1.2.2 PICKERING WHITES INTENSIFICATION AREA

Lastly, a series of new public streets and private streets are proposed as part of the Whites Precinct Intensification Area, as discussed in **Section 3.2.3**. The planned public road opposite to Delta Boulevard into the site is illustrated as part of the Whites Precinct Intensification Area.

4.1.2.3 PICKERING INTEGRATED TRANSPORTATION MASTER PLAN

Beyond the development boundaries of the site, area network roadway improvements are also proposed or underway. As such, roadway changes along the entirety of Kingston Road are expected as part of the future DSBRT, discussed further in **Section 4.2.2**. These changes include accommodating dedicated bus lanes along Kingston Road, as per Pickering's ITMP, and improvements to the pedestrian and cycling infrastructure along the corridor. Additionally, the ITMP states that Whites Road is proposed to be widened and extended with a total of six (6) or seven (7) lanes to accommodate a HOV lane between Kingston Road in the south and Highway 7 in the north.

The proposed road network is illustrated in **Figure 3**.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 3 AREA ROAD NETWORK

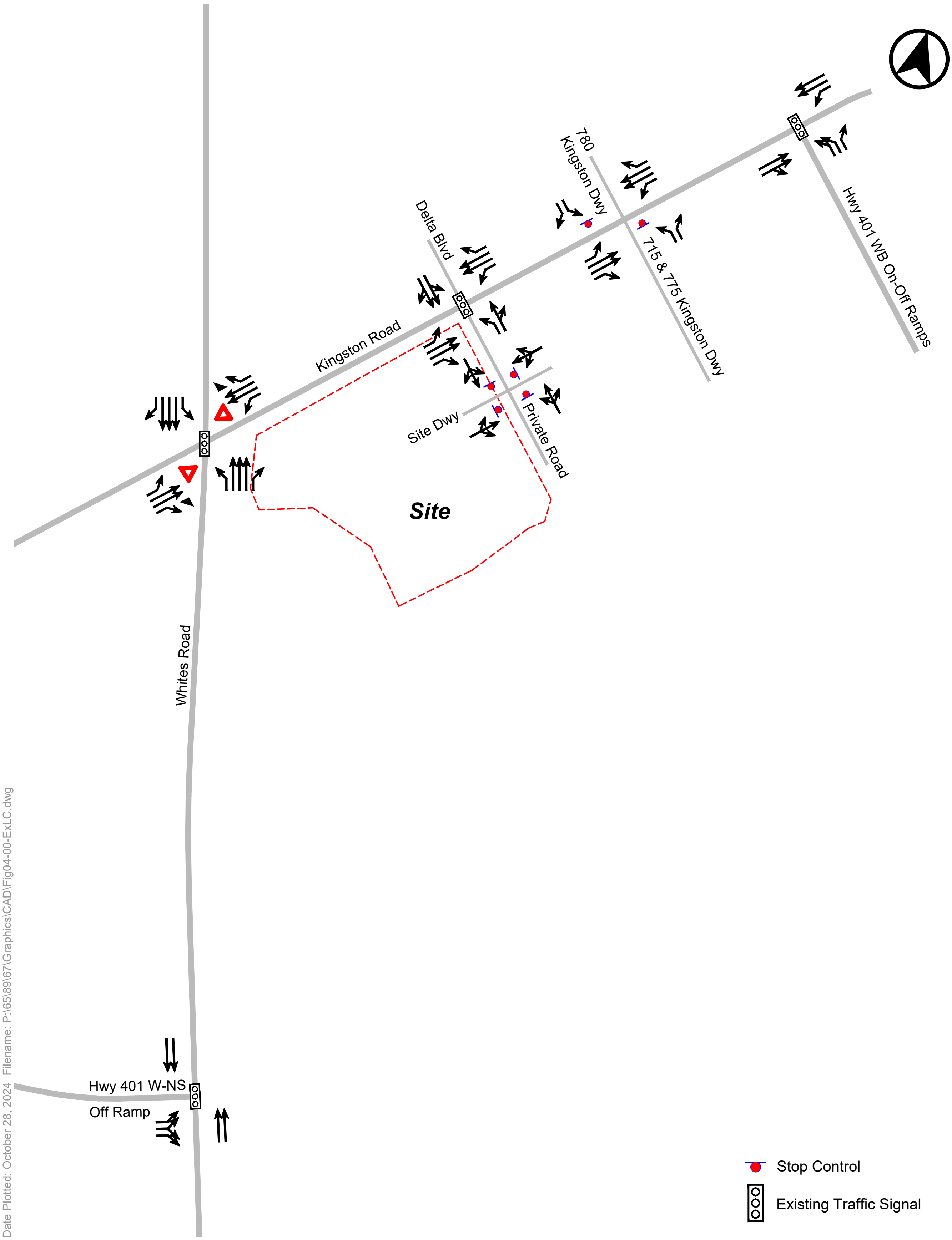

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FIGURE 4 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

4.2 Area Transit Network

4.2.1 Existing Transit Context

The site is well-served by local and regional transit services operated by GO Transit and DRT, including DRT PULSE express bus service. PULSE corridors typically feature dedicated lanes or priority transit measures, such as HOV lanes, queue jump lanes or signal priority.

Several bus stops, located within walking distance of the site, provide direct connections to key local and regional transit destinations, including the Pickering Town Centre (Pickering Parkway Terminal), and the Pickering GO Station along the Lakeshore East GO Line. Specifically, a shared DRT / GO bus stop is located on Kingston Road at Whites Road, abutting the site's northern property line.

An overview of the existing area transit services is summarized in **Table 3** and illustrated in **Figure 5**.

Table 3 Existing Transit Network

Route	Transit Service Type	Closest Stop (Approximate Walking Distance to Site)	Approximate Headway (Weekday Peaks)	Route Description
41 / 41A: Hamilton/Pickering	GO Transit Bus	Eastbound: Kingston Road at Whites Road (adjacent to site) Westbound: Kingston Road at Fairport Road (850 metres / 12-minutes)	15 - 30 minutes	The 41 Hamilton/Pickering GO bus route operates in an east-west direction between Pickering GO and Hamilton GO in the City of Hamilton. Key destinations on this route include the University of Toronto Scarborough, Centennial College, Scarborough Town Centre, Highway 407 Bus Terminal, Bramalea GO, Square One, and McMaster University. The 41A GO bus route is a shortened variant of the 41 GO bus route which operates in an east-west direction between Pickering GO and Square One in the City of Mississauga.
92 / 92A: Oshawa/Yorkdale	GO Transit Bus	Kingston Road at Whites Road (adjacent to site)	1 hour	The 92 Oshawa/Pickering GO bus route operates in an east-west direction between Oshawa GO and Yorkdale Bus Terminal in the City of Toronto. Key destinations on this route include York Mills Bus Terminal and Scarborough Town Centre. The 92A branch is a shortened variant of the 92 GO bus route which operates in an east-west direction between Dundas at Highway 412 in the City of Whitby and Yorkdale Bus Terminal in the City of Toronto.

Route	Transit Service Type	Closest Stop (Approximate Walking Distance to Site)	Approximate Headway (Weekday Peaks)	Route Description
PULSE 900	DRT Bus	Kingston Road at Whites Road (adjacent to site)	30 minutes	The PULSE 900 DRT bus route operates in an east-west direction between King Street / Bond Street at Ritson Road in the City of Oshawa and Centennial Circle in the City of Toronto.
PULSE 920	DRT Bus	Kingston Road at Whites Road (adjacent to site)	15 minutes	The PULSE 920 DRT bus route operates in an east-west direction between Harmony Terminal in the City of Oshawa and Scarborough Centre in the City of Toronto.
118	DRT Bus	Kingston Road at Whites Road (adjacent to site)	30 minutes	The DRT 118 bus route operates in a north-south between the Pickering Parkway Terminal and the area of Burkholder Drive and Hibiscus Drive.
121	DRT Bus	Kingston Road at Whites Road (adjacent to site)	30 minutes	The DRT 121 bus route operates in an east-west direction between Pickering Parkway Terminal and the Pickering GO Station.

4.2.2 Planned Transit Context

While the existing DRT and GO bus stops adjacent to the site provides good connectivity across the City of Pickering and adjacent municipalities, planned investments in rapid transit will significantly improve the transit options and transit accessibility for future site users. Most notably, the site's transit connectivity will benefit from improvements planned and under construction by Metrolinx (e.g., Durham-Scarborough BRT).

An overview of planned transit improvements in proximity of the site is summarized below and illustrated on **Figure 5**.

4.2.2.1 DURHAM-SCARBOROUGH BUS RAPID TRANSIT

Metrolinx is working with Durham Region and DRT, amongst other stakeholders, on the planning and design of a rapid transit corridor extending from Scarborough Centre to Downtown Oshawa, along the Highway 2-Ellesmere corridor (including Kingston Road in the City of Pickering). The DSBRT proposes approximately 49 BRT stops that would serve as a continuous 36-kilometre corridor connecting five municipalities, Oshawa, Whitby, Ajax, Pickering and Scarborough, and their Regional Centres and major employment, institutional, and population nodes. This project builds upon the existing DRT PULSE express bus service which currently runs between downtown Oshawa and the University of Toronto Scarborough Campus. As such, the closest stop to the site will be located at Kingston Road and Whites Road, adjacent to the site.

Key features and benefits of the future DSBRT include the following:

- 15-minute or better service (all day, seven days a week), with a bus every five minutes or less during rush hours;
- Dedicated bus lanes and signal priority measures;
- 10-to-20-minute time savings for transit trips along the corridor and;
- Efficient transfers between routes, allow for more convenient and reliable travel across the Greater Toronto and Hamilton Area (“GTHA”).

The DSBRT Study was initiated in 2018 as part of an Initial Business Case (“IBC”) report following the release of Metrolinx’s 2041 Regional Transportation Plan which identified BRT as the preferred transit technology to link Durham and Scarborough. Following numerous public engagement sessions, the Transit Project Assessment Process (TPAP) was completed on March 21, 2022, and a Minister’s Notice to Proceed on the project was issued on March 28, 2022.

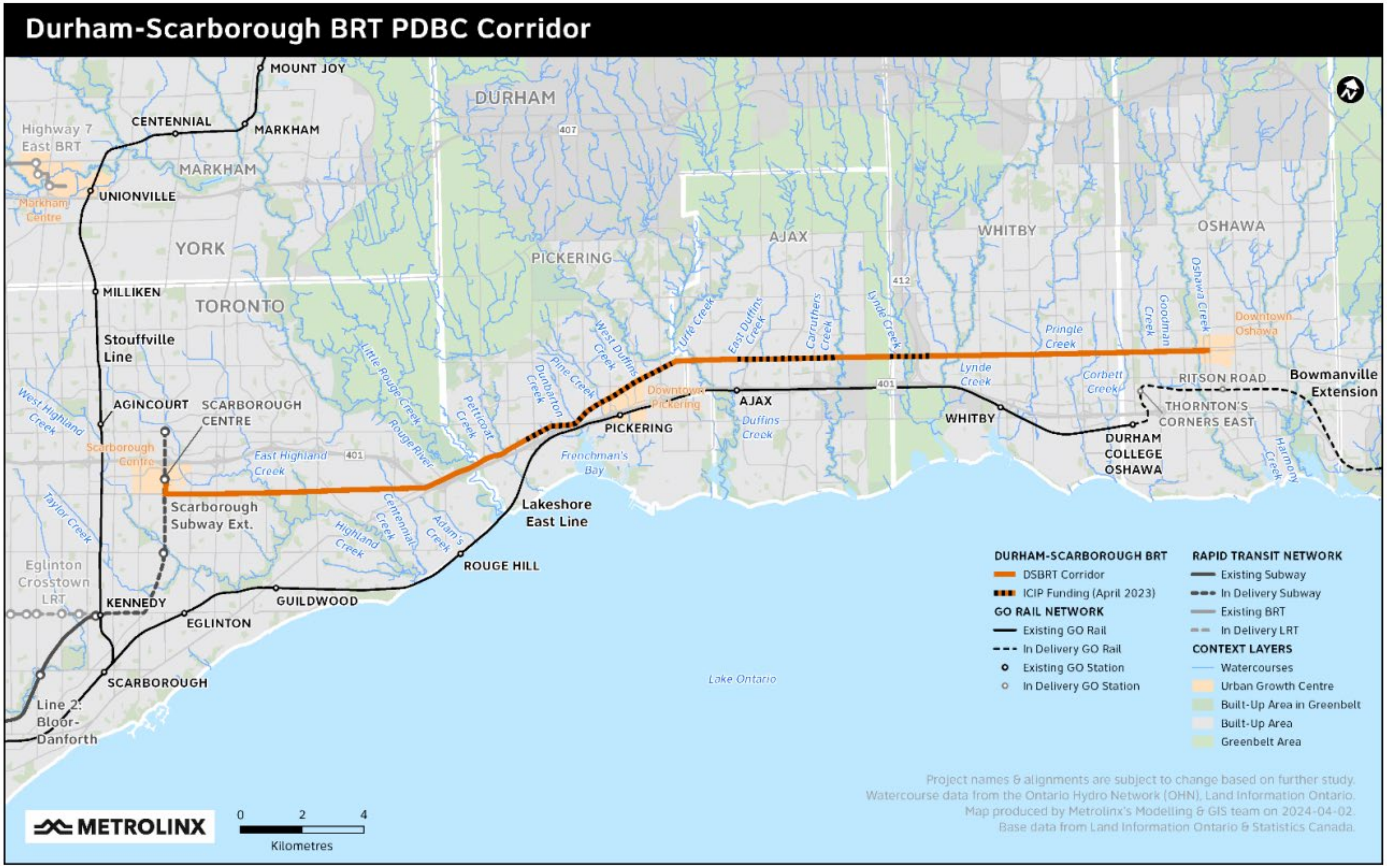
As part of the Environmental Project Report (“EPR”), which was approved in January 2022 following the TPAP completion, preliminary designs were developed which generally included dedicated centre-median bus lanes, some segments with dedicated curbside bus lanes, and some short segments with no dedicated infrastructure where buses would operate in mixed traffic with transit priority measures and curbside stops. Segment 3 of the EPR (Kingston Road from Altona Road to Elizabeth Street), which captures the site, is proposed to be widened to six (6) lanes to accommodate centre-median rapid transit lanes while maintaining two general traffic lanes in each direction. In particular, Appendix A1.2 of the EPR provides a high-level 2D conceptual plan for the design of the BRT, including the portion between Whites Road and Delta Boulevard, directly adjacent to the site, discussed further in **Section 10.1**.

In June 2024, Metrolinx released the findings of their DSBRT Preliminary Design Business Case (“PDBC”) which advances the planning, refinement, and optimization of the DSBRT. It is noted that funding has already been secured along core segments of the DSBRT corridor within Pickering, Ajax, and Whitby, including the segment near the site, as illustrated on **Exhibit 2**. As such, the PDBC evaluates three potential investment options developed based on the EPR’s preliminary design, all of which include the segments of the BRT that have secured federal funding. The major difference between the three options is the timing of full BRT implementation with different criteria for the prioritization or deferral of various segments of the transit corridor. As per the 2024 PDBC, the revised opening year of the DSBRT is expected to be in 2033.

With the completion of the DSBRT, future site users will have more flexibility and choice for travel within the GTHA, providing an alternative to trips that would otherwise be taken by automobile. The project will allow for seamless connections between various local transit networks and will provide the residents of Durham Region and the City of Toronto with faster and more reliable transit accessibility across the Region.

Overall, the proposed design of the DSBRT provides exclusive bus lanes along Kingston Road at the location of the site, which presents a significant opportunity to build a truly transit-oriented developments with high density and mixed-uses. This type of development and transit accessible location is an appropriate setting to provide reduced parking at the site.

Exhibit 4. Metrolinx Durham-Scarborough BRT PDBC Corridor



4.2.2.2 METROLINX GO EXPANSION

Metrolinx is undertaking a “GO Expansion” project that seeks to increase GO regional passenger rail service through expansion and the electrification of the GO Transit rail network. As per the November 2018 “GO Expansion Full Business Case” published by Metrolinx, “GO Expansion is an investment program that will transform GO Rail into a Rapid Rail System that provides the expanded mobility the GTHA needs to accommodate growth and maintain a high quality of life and prosperous economy”.

A key benefit of rail electrification is quicker acceleration / deceleration (up to 30% faster), resulting in faster travel times and, therefore, unlocking the potential to add more stations to existing rail lines. Along the Lakeshore East Line, accessible from the site via Pickering GO Station, an extension of the rail service further east into Bowmanville is currently being planned. Furthermore, the proposed improvements and expansions to the GO rail network will enable all-day, two-way service with significantly increased service frequencies (every 15 minutes or better) on most of GO’s lines, including the Lakeshore East Line. Overall, the GO Expansion will provide future site residents and visitors with enhanced regional transit access and faster travel times across municipalities, further reducing reliance on the private automobile.

The GO Expansion is currently underway with incremental improvements to service beginning in 2025-2026 and expected to continue to completion in 2032.

4.2.2.3 METROLINX GO EXPANSION RER NEW STATIONS BUSINESS CASE ANALYSIS: POTENTIAL WHITES GO STATION

In a June 2016 report, Metrolinx examined several potential new station locations across the seven (7) existing GO Transit rail corridors in light of the GO Expansion program (i.e., GO Regional Express Rail (RER) and City of Toronto’s SmartTrack Stations Program). The initial business case (IBC) approach analyzed each potential station based on a strategic and financial case. Among the stations identified was a station at Whites Road, south of Highway 401, on the Lakeshore East Line. The site is located within the one-kilometre buffer area of the proposed station location.

The report concluded that the Whites Road station did not satisfy enough of the strategic and financial case criteria to be considered for near-term consideration and potential implementation. The main criteria that Whites Road failed to satisfy were as follows:

- The anticipated future density (approximately 30-40 people + jobs per hectare (P+J / Ha) within 800 metres) of the station did not meet Metrolinx’s Mobility Hub density targets;
- The majority of trips at this station would be from existing customers that use the Pickering or Rouge Hill stations;
- The station would result in a net loss of trips due to negative time impacts to upstream riders; and
- A negative net present values is anticipated due to capital costs, annual station and train operation costs, and the anticipated net loss of fare revenue.

Since the release of the June 2016 IBC report, the City of Pickering released its Kingston Road Corridor Intensification Study in 2019. As discussed in **Section 3.2.3**, the Study explored growth opportunities along the Kingston Road corridor and recommended increased densities in the vicinity of the site (i.e., Whites Precinct). As per the Study, the potential mixes of uses and densities proposed by the intensification study results in a total of 7,622 residents and 2,536 jobs on potential redevelopment sites within Whites Precinct, which could increase the number of riders and minimize the net loss of trips.

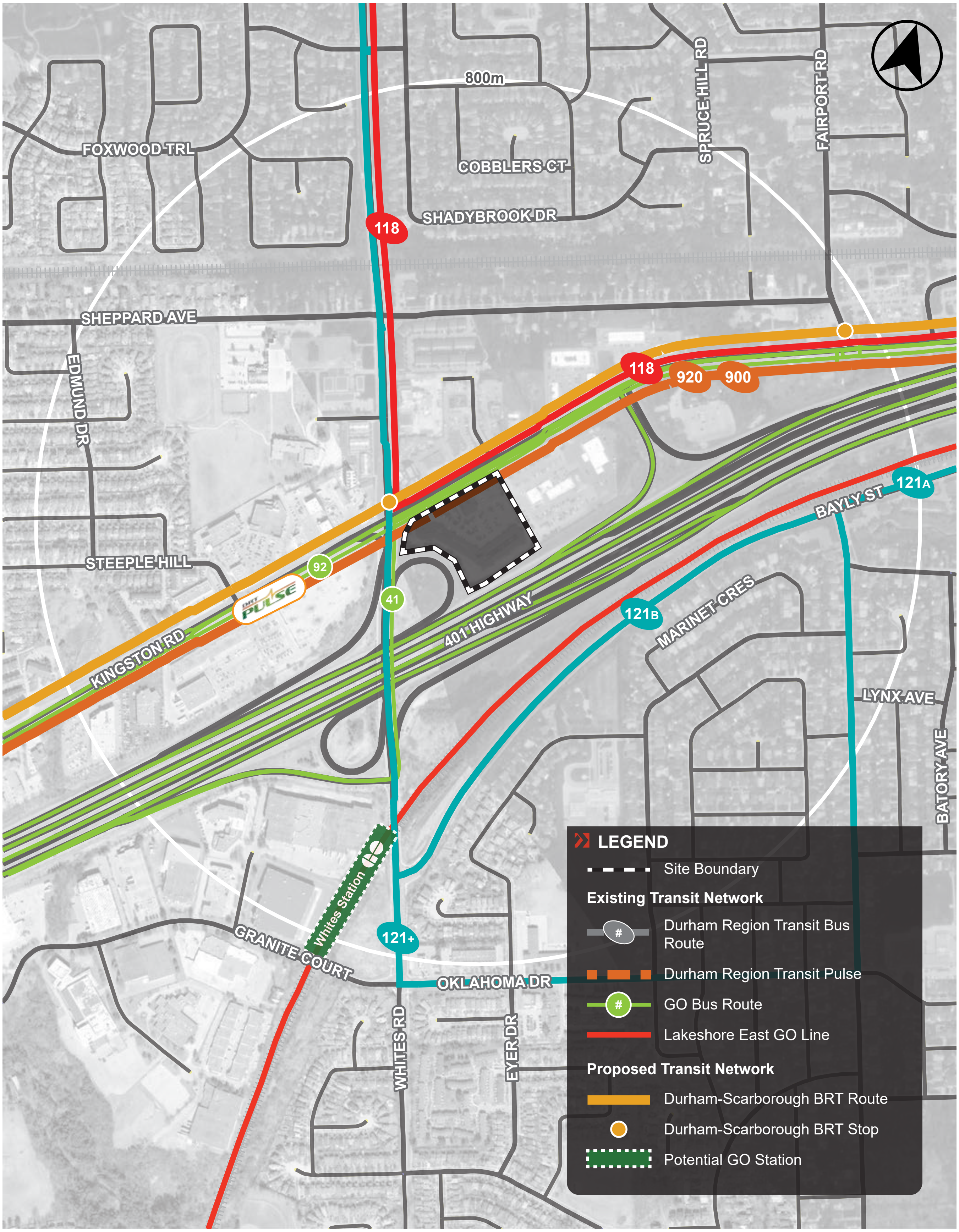


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FIGURE 5 AREA TRANSIT NETWORK

4.2.3 Transit Reach Analysis

4.2.3.1 EXISTING TRANSIT TRAVEL REACH

To understand the changing transportation context within the site area, transit service area analyses for both the existing and future transit networks were conducted using Geographic Information Systems ("GIS"). These analyses look at the transit service area that a site user has access to within a given time range. This type of analysis is useful in understanding the transit accessibility and can also be useful to quantify the impact of transit service changes.

Transit reach analyses were conducted to and from the site in 15, 30, and 45-minute intervals during the weekday morning travel period. Transit travel times include walking time to and from transit stop, as well as existing transit schedules during peak hour (i.e., service frequency and wait times), all of which are based on the existing transit service. Transit reach assessments were conducted traveling away from (outbound) the site and traveling towards (inbound) the site to represent the typical travel patterns of residents, visitors, employees, and customers.

The existing transit travel reach traveling away from the site, and travelling towards the site are illustrated in **Figure 6** and **Figure 7** , respectively.

4.2.3.2 FUTURE TRANSIT TRAVEL REACH

The review of projected transit travel times assumed the various public transit network improvements that were noted in **Section 4.2.2** and illustrated in **Figure 8** and **Figure 9**. A comparison of areas that are reachable is provided in **Table 4** below.

Table 4 Existing and Future Transit Service Area Analysis Comparison

Transit Scenario	15-minute Reach	30-minute Reach	45-minute Reach
Existing Conditions (Travel Away From Site)	• North along Whites Rd to Strouds Ln; • South along Whites Rd just past Oklahoma Dr; • East along Kingston Rd to Brock Rd; and • West along Kingston Rd to Sheppard Ave E/Port Union Rd.	• North along Whites Rd past Finch Ave; • South along Whites Rd, and Port Union Rd to the waterfront; • East along Kingston Rd to Salem Rd; and • West along Ellesmere Rd to Morningside Ave, and Kingston Rd and Sheppard Ave E to Markham Rd.	• North along Whites Rd to Third Concession Rd, and Westney Rd to Taunton Rd • South along Whites Rd, and Kingston Rd Morningside Ave to the waterfront; • East along Kingston Rd and Dundas St W to Thickson Rd S; and • West along Ellesmere Rd to Kennedy Rd.
Existing Conditions (Travel Towards Site)	• North along Whites Rd to Strouds Ln; • South Along Whites Rd to Oklahoma Dr; • East along Kingston Rd to Brock Rd; and • West along Kingston Rd to Sheppard Ave E/Port Union Rd.	• North along Whites Rd past Finch Ave; • South along Whites Rd, and Port Union Rd to the waterfront; • East along Kingston Rd to Salem Rd; and • West along Ellesmere Rd to Markham Rd.	• North along Whites Rd to Third Concession Rd, Salem Rd to Taunton Rd; • South along Whites Rd, Kingston Rd Morningside Ave to the waterfront; • East along Kingston Rd and Dundas St W to Thornton Rd S, along GO Transit Lakeshore East Line to Oshawa GO; and • West along Kingston Rd to Ellesmere Rd, Sheppard Ave E to Birchmount Rd.

Transit Scenario	15-minute Reach	30-minute Reach	45-minute Reach
Future Conditions (Travel Away From Site) *With the addition of the Durham-Scarborough BRT, GO Expansion, etc.*	• North along Whites Rd to Strouds Ln; • South along Whites Rd to Oklahoma Dr; • East along Kingston Rd to Brock Rd; and • West along Kingston Rd past Meadowvale Rd.	• North along Whites Rd past Finch Ave, and Brock Rd to Third Concession Rd; • South along Whites Rd, and Port Union Rd to the waterfront; • East along Kingston Rd to Hardwood Ave N; and • West along Ellesmere Rd to McCowan Rd.	• North along Whites Rd to Third Concession Rd, and Brock Rd to Taunton Rd; • South along Whites Rd to the waterfront, Markham Rd to the waterfront; • East along Kingston Rd and Dundas St W to Thickson Rd, along GO Transit Lakeshore East Line to Oshawa GO; and • West along Kingston Rd Eglington Ave E to Kennedy GO Station, along GO Transit Lakeshore East Line to Danforth GO.
Future Conditions (Travel Towards Site) *With the addition of the Durham-Scarborough BRT, GO Expansion, etc.*	• North along Whites Rd to Strouds Ln; • South along Whites Rd to Oklahoma Dr; • East along Kingston Rd to Brock Rd; and • West along Kingston Rd past Meadowvale Rd.	• North along Whites Rd past Finch Ave, and Brock Rd to Third Concession Rd; • South along Whites Rd, and Port Union Rd to the waterfront; • East along Kingston Rd to Salem Rd; and • West along Ellesmere Rd to McCowan Rd.	• North along Whites Rd to Third Concession Rd, Westney Rd N to Taunton Rd; • South along Whites Rd, and Markham Rd to the waterfront; • East along Kingston Rd to Thornton Rd, along GO Transit Lakeshore East Line to Oshawa GO; and • West on Ellesmere Rd past Birchmount Rd, and along GO Transit Lakeshore East Line to Danforth GO.

Notable findings include:

- Within 15 minutes of the site, existing condition transit access is primarily along the Kingston Road corridor running east-west, with access to Pickering GO Station. Under future conditions, there are some improvements to the travel reach along the Kingston Road corridor due to the DSBRT
- Within 30 minutes of the site, under existing conditions transit is accessible as far west as central Scarborough and as far east as central Ajax. North transit access is limited by the lack of transit routes north of the site, while south of the site transit access reaches the waterfront. Pickering GO, Rouge Hill GO, and Ajax GO Stations are accessible within a 30-minute transit travel from the site. Under future conditions, westbound transit access has a noticeable improvement extending nearly to the Scarborough Subway extension, and Eglinton GO Station is now accessible. There is some northbound transit improvement under future conditions.

- Within 45 minutes of the site, existing condition transit access remains primarily east-west focused, with access to areas as far north as Taunton Rd through Pickering and Ajax. Significant amounts of Scarborough are within westbound transit reach while the eastbound transit reach extends into central Whitby. Under future conditions, there is minimal expansion in transit reach to the east and west in comparison to the existing condition. There are some improvements to access along the GO Transit Lakeshore East Line, reaching as far west as Danforth GO and as far east and Oshawa GO, due to GO Regional Rail Expansion ("GO RER") along this line

Based on the foregoing, the site is reasonably accessible by transit under existing conditions with most travel possibilities being east-west oriented. Westbound travel reaches into Scarborough while eastbound provides access through Ajax and into Whitby. Northbound travel is limited to infrequent bus service serving primarily low-density residential developments, southbound travel extends to the waterfront, providing access to GO Stations along the Lakeshore East Line. Under future conditions with the addition of the Durham-Scarborough BRT there is an increase to east-west travel potential along the Ellesmere Rd-Kingston Rd-Dundas St W corridor. The future GO RER will provide an increase to potential reach both east and west.

Overall, the evolving transportation network visualised in this analysis indicates that at a local level there are suitable alternatives to travel by personal vehicle. The existing transit services provide reasonable access along developed corridors and into neighbouring municipalities. The future context will provide enhanced regional transportation options as well as more frequent bus rapid transit east and west. The site is reasonably located to allow residents and visitors access through transit options.

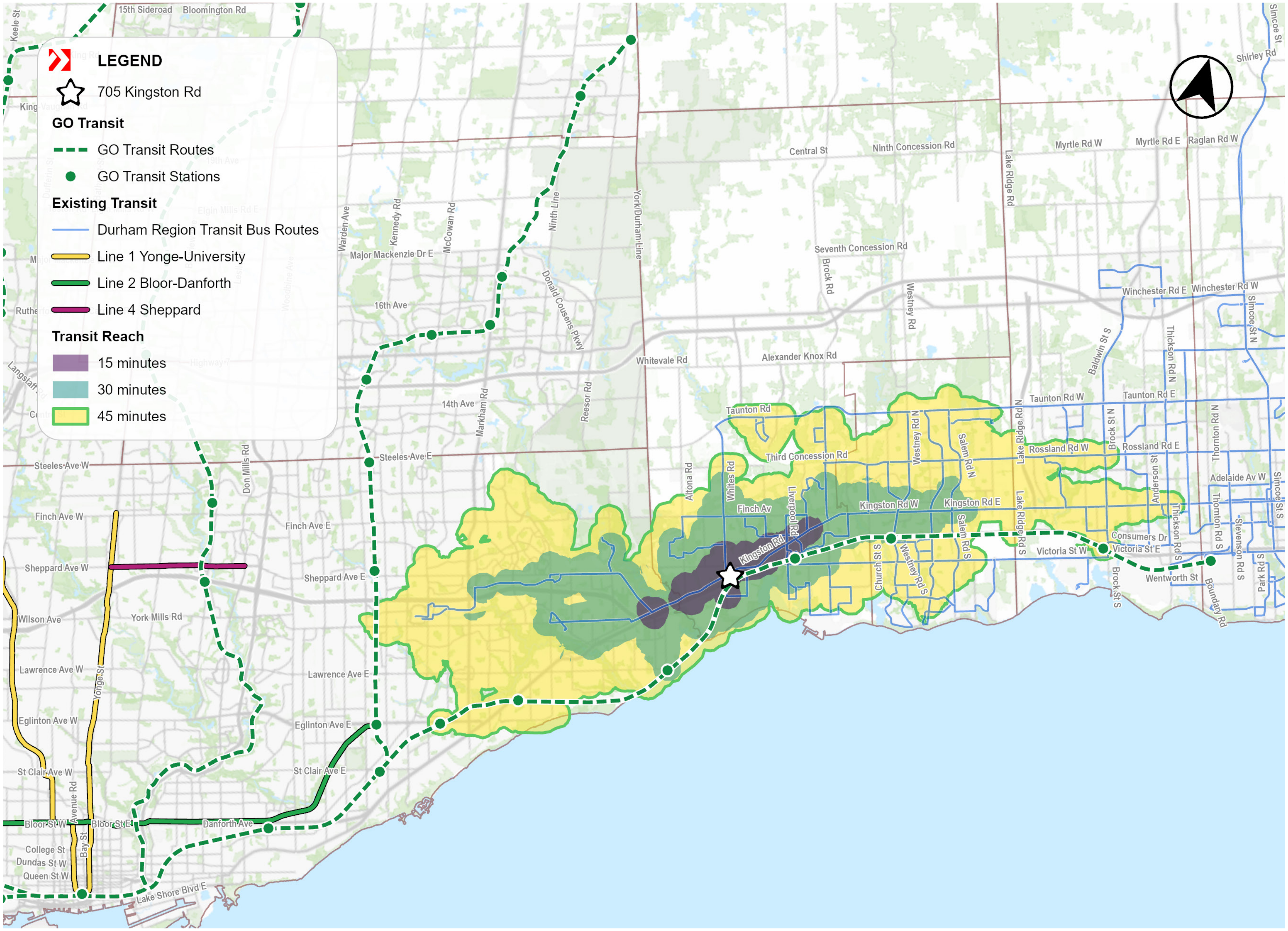

FIGURE 6 EXISTING TRANSIT REACH – MORNING PEAK (AWAY FROM SITE)

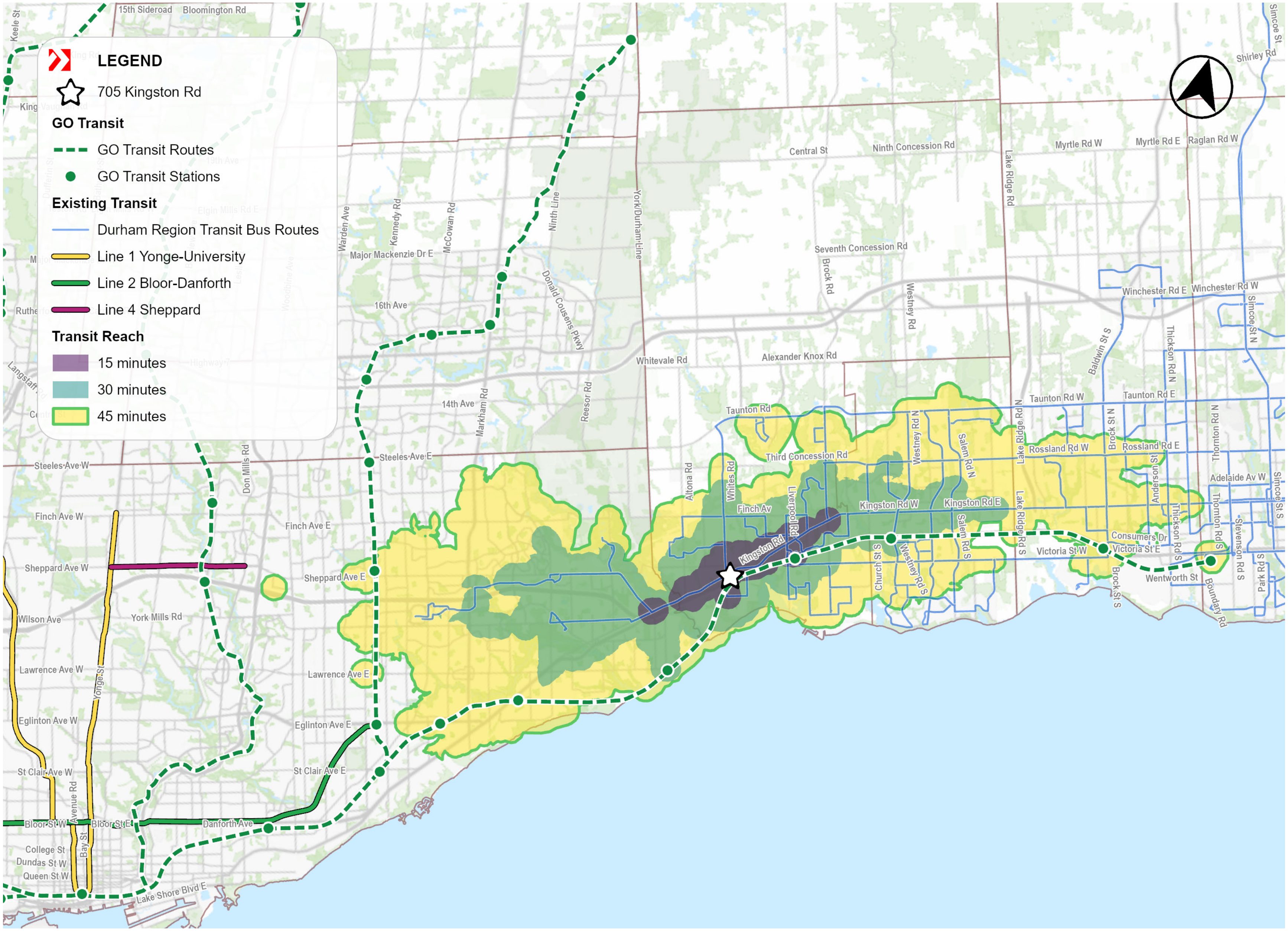

FIGURE 7 EXISTING TRANSIT REACH – MORNING PEAK (TOWARDS SITE)

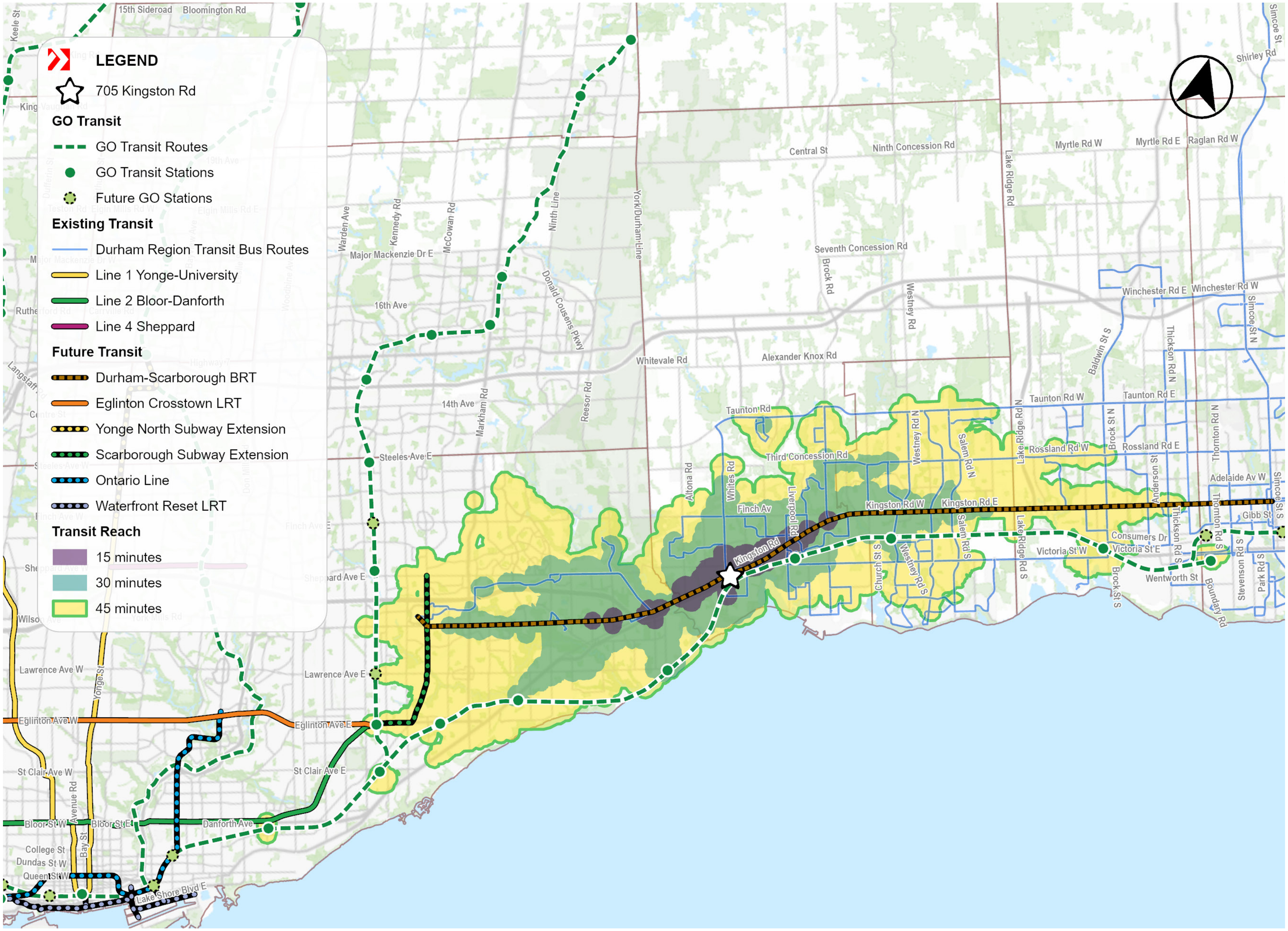

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FIGURE 8 FUTURE TRANSIT REACH – MORNING PEAK (AWAY FROM SITE)

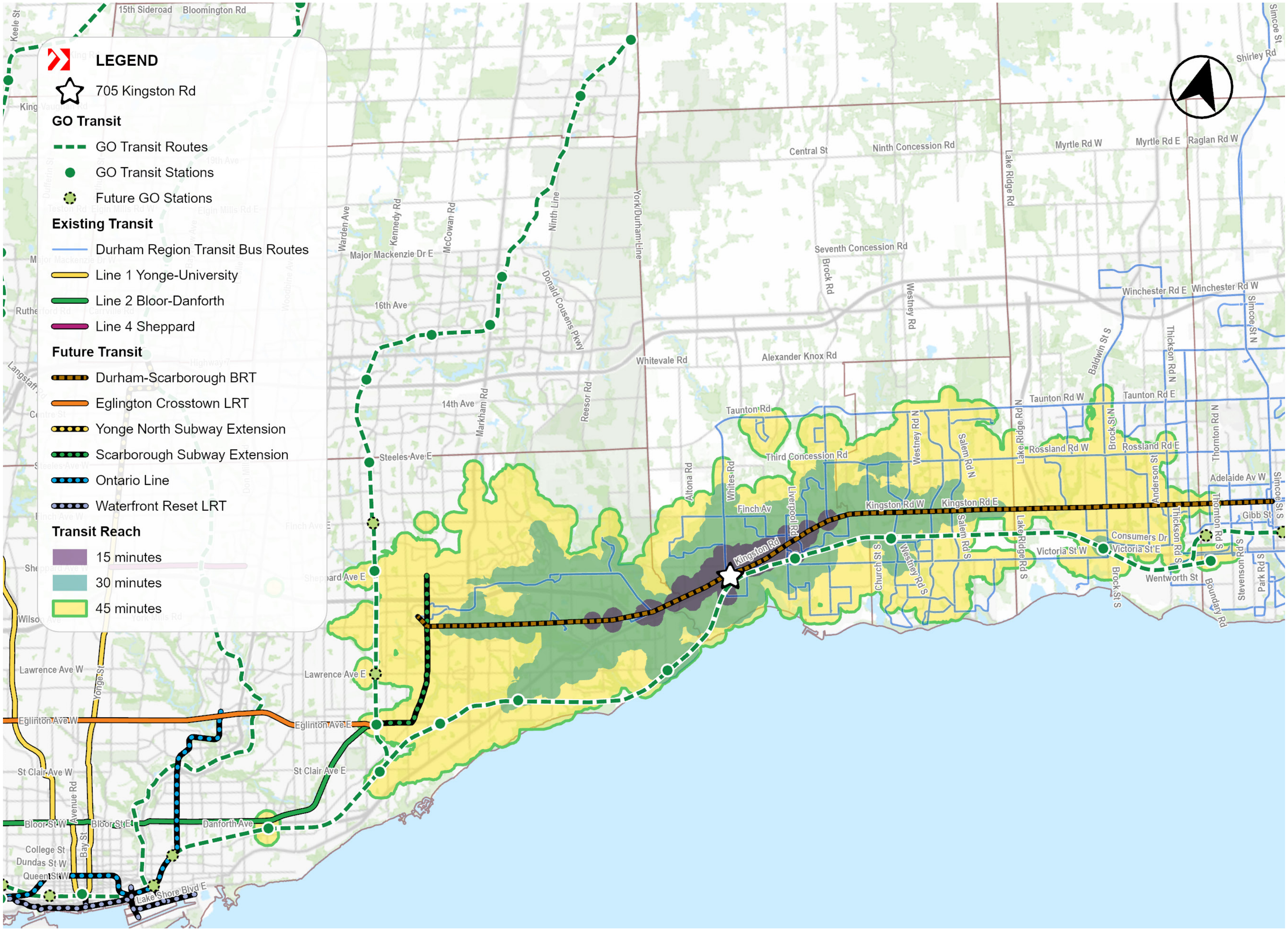


FIGURE 9 FUTURE TRANSIT REACH – MORNING PEAK (TOWARDS SITE)

4.3 Pedestrian Context

4.3.1 Existing Pedestrian Network

The site is centrally located along the Kingston Road corridor, just outside of the City Centre. There are a mix of uses along this corridor that can be accessed by walking, however, the vehicle-oriented design of the area (i.e. large surface parking lots, wide streets, lack of mid-block crossings) does not prioritize pedestrian travel.

4.3.1.1 PEDESTRIAN FACILITIES

In the immediate site area, pedestrian sidewalks are provided along both sides of Kingston Road and Whites Road, the key east-west and north-south pedestrian connections near the site. Along Kingston Road, there is generally a landscaped buffer provided between the sidewalk and vehicular traffic lanes, however, along Whites Road, there is generally no buffer provided. Additionally, there are currently no pedestrian facilities that connect the commercial uses on the site to the external sidewalks.

Pedestrian crossing opportunities are provided at major intersections within the site vicinity, including the signalized intersection adjacent to the site at Kingston Road / Delta Boulevard and at Kingston Road / Whites Road, both of which provide marked crosswalks and pedestrian signal heads in all directions. It is noted that there are limited mid-block crossings along Kingston Road, west and east of Whites Road, which hinders pedestrian mobility in the area.

The area pedestrian network is illustrated on **Figure 10**.

4.3.1.2 PEDESTRIAN AMENITIES

The site's location at the key Kingston Road / Whites Road intersection is walkable to a variety of desirable retail, recreational, and institutional services and amenities, such as restaurants / food establishments, healthcare services and pharmacies, banks, grocery stores, community centres, parks, and schools. The pedestrian amenities within walking distance of the site are generally located north of Highway 401. Due to the current car-oriented design of the built form (e.g., building setbacks) within the immediate area, sidewalks are primarily provided along the major roadways and have limited permeability to and from internal building entrances (i.e., pedestrians are to walk across parking lots or have limited midblock crossing / entrance opportunities).

Overall, daily errands and leisurely activities, inclusive of recreational, retail, and institutional uses, may be undertaken without the use of a personal vehicle, minimizing automobile travel to / from the site.

The existing area pedestrian destinations are illustrated on **Figure 11**.

4.3.2 Pedestrian Improvements

4.3.2.1 AREA IMPROVEMENTS

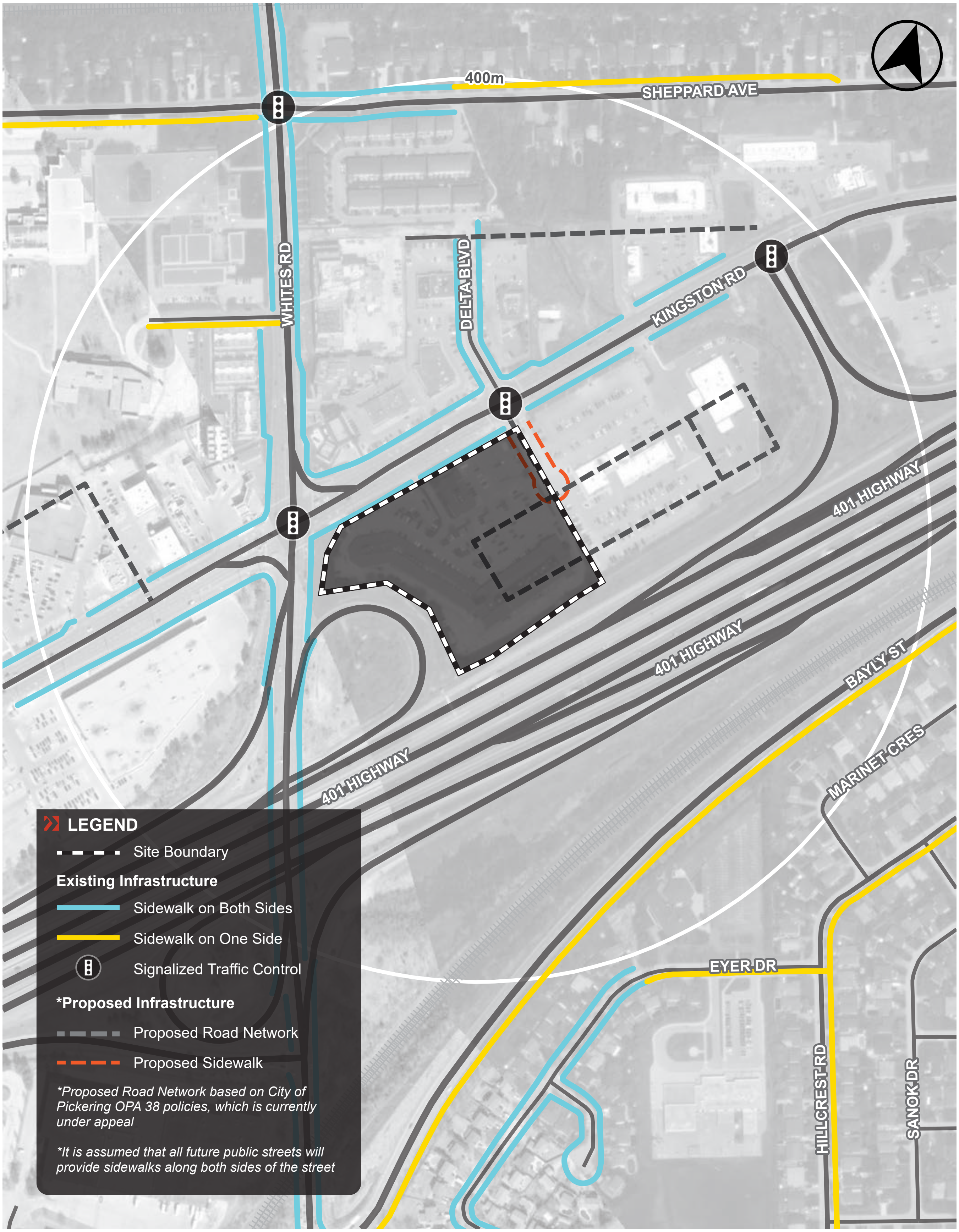
The Kingston Road Corridor and Specialty Retailing Node Intensification Plan, as introduced in **Section 3.2.3**, proposes numerous improvements for the pedestrian realm along Kingston Road within the Whites Precinct. Retail and secondary frontages along Kingston Road are proposed to animate the public realm and provide more opportunities for pedestrian interactions at-grade. As well, the Plan proposes new park land within the precinct to create new pedestrian links from Kingston Road to the areas surrounding the corridor. At the frontage of the site along Kingston Road, it is proposed to provide an enhanced 6.0-metre pedestrian pathway.

In addition, as part of the proposed development, improvements to the existing pedestrian and cycling condition along the new public north-south road adjacent to the site are provided. Along both sides of the new public road, it is proposed to provide sidewalks and uni-directional cycle tracks. This new infrastructure will provide pedestrian and cycling connectivity between the new uses on-site and the wider active transportation network and surrounding uses. Further, the removal of the large surface parking lots and the proposed at-grade retail uses adjacent to Kingston Road creates an opportunity for pedestrian interaction and will improve the public realm of the general site area.

4.3.2.2 ON-SITE PLANNED PEDESTRIAN IMPROVEMENTS

In addition, to the area pedestrian improvements, improvements to the on-site pedestrian context are also proposed, including the following:

- Pedestrian pathways within the site to provide connectivity to proposed residential lobby and retail entrances; and
- Urban park located at the north-east corner of the site, offering a new pedestrian amenity for site users and the general neighbourhood, improving connectivity from the new uses on-site to the wider transportation network.
- Further details on these pedestrian improvements are illustrated in **Appendix D**.



Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

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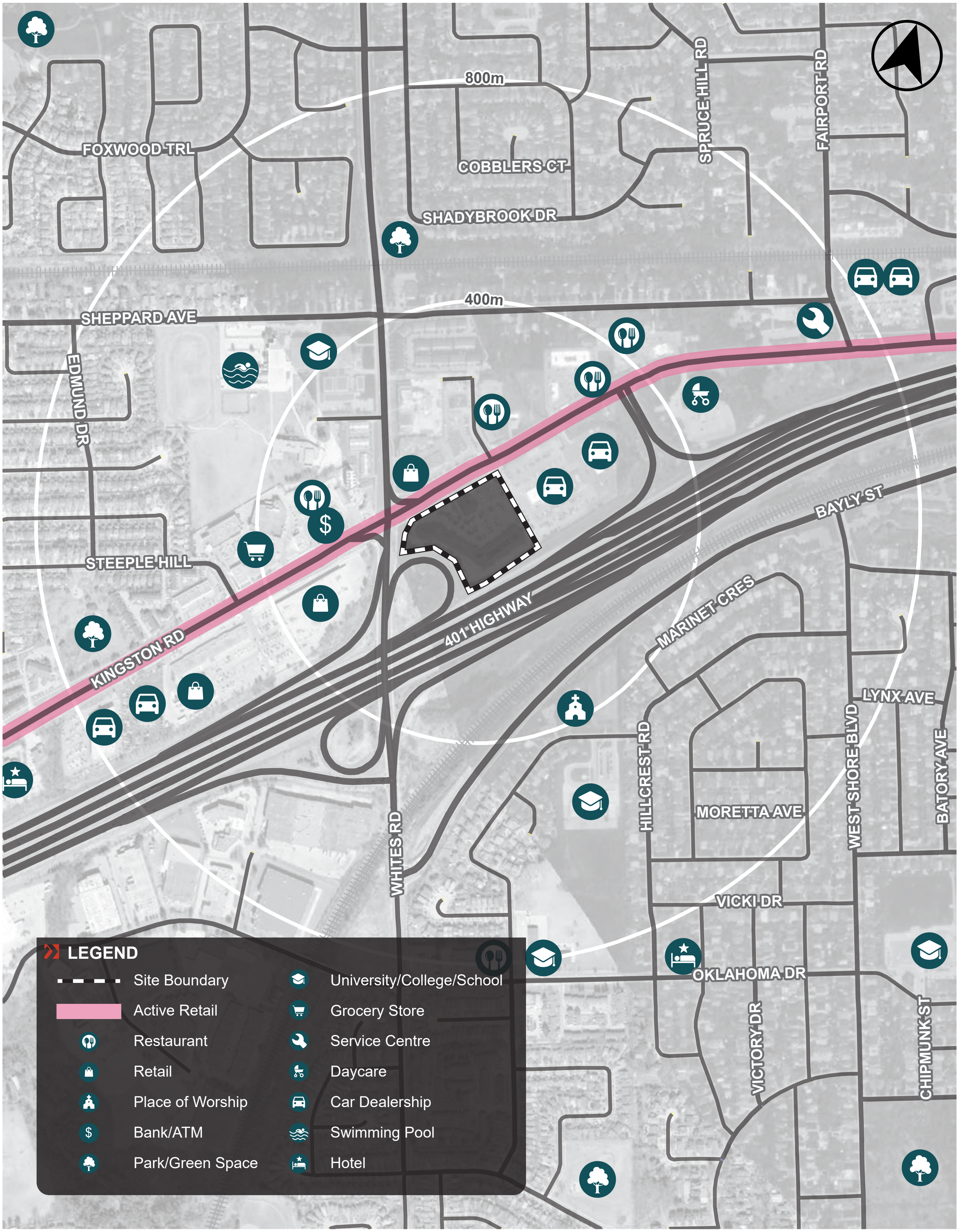
FIGURE 10 AREA PEDESTRIAN CONTEXT



Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

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FIGURE 11 AREA PEDESTRIAN DESTINATIONS

4.4 Area Cycling Context

4.4.1 Existing Cycling Network

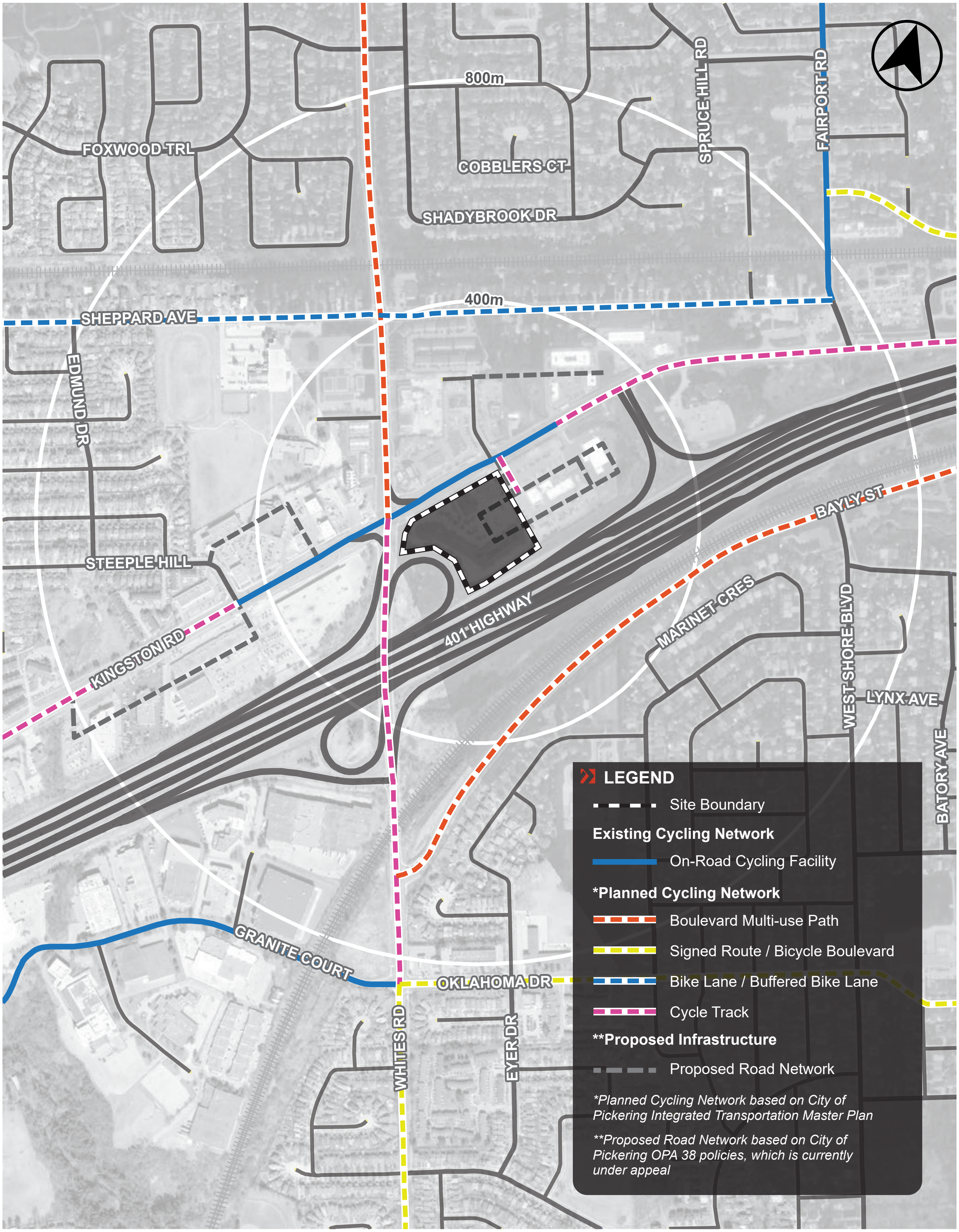
The site is located along a portion of the Kingston Road bike lane that has been constructed from a point approximately 140 metres west of Steeple Hill to a point approximately 70 metres east of Delta Boulevard. The bike lanes are provided along both sides of the roadway as a designated lane that is marked on the pavement.

4.4.2 Planned Cycling Network Improvements

The City and Region includes plans for the City's long-term cycling network. Consistent with OPA 38, Intensification Plan, Urban Design Guidelines, ITMP, and RCP, future cycling infrastructure and routes near the site vicinity include the following:

- North-South Public Road: Cycle tracks are proposed to be provided along both sides of the north-south public road (i.e., adjacent to the proposed development). The provision of this road as part of the development proposal is consistent with OPA 38, Kingston Corridor Intensification Plan, and UDG.
- Kingston Road: Cycling infrastructure on Kingston Road is proposed to be continuous, extending from the City of Pickering's western boundary to Highway 412 in the east, beyond the City's eastern boundary, where the route will continue into the rest of Durham Region along Dundas Street. Within the site vicinity, this route is expected to be delivered as a cycle track, as referenced in the DSBRT 30% preliminary design concept, ITMP, and RCP.
- Whites Road: Cycling infrastructure is proposed along White Road, extending from the waterfront in the south to Finch Avenue in the north. Within the site vicinity, this route is proposed to be delivered as a boulevard multi-use path north of Kingston Road and a cycle track south of Kingston Road, as referenced in the ITMP and RCP.
- Bayly Street: Cycling infrastructure is proposed along Bayly Street, extending from Whites Road in the west to the City of Pickering's eastern boundary where the route continues into the rest of Durham Region. Within the site vicinity, this route is proposed to be a boulevard multi-use path, as referenced in the ITMP and RCP.
- Sheppard Avenue: Cycling infrastructure is proposed along Sheppard Avenue / Twyn Rivers Drive from the City of Pickering's western boundaries Fairport Road in the east. This route is proposed to be a bike lane / buffered bike lane, as referenced in the ITMP.

The existing and planned cycling infrastructure network is illustrated in **Figure 12**.



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Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographies, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 12 AREA CYCLING CONTEXT

5.0 VEHICLE PARKING

5.1 Subject Zoning By-law Vehicle Parking Requirements

5.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to the City of Pickering Zoning By-law 3036 vehicle parking standards, as amended by Site-specific Zoning By-law 2324/86. A summary of the minimum vehicle parking requirements for the site, as per Zoning By-law 3036, is provided in **Table 4**.

Table 5 City of Pickering Zoning By-law 3036 Minimum Parking Requirements

Use	Units/GFA/Category[1,2]	Minimum Rate	Minimum Requirement[3]
Apartment Dwelling	1,748 units	1.75 spaces / unit	3,059 spaces
Resident Subtotal	--	--	*3,059 spaces*
Residential Visitor	1,748 units	Inclusive of minimum resident rate	-
Retail[2]	3,922 m^2	5 spaces / 93 m^2 GLFA	211 spaces
Non-Resident Subtotal	--	--	*211 spaces*
Total Vehicle Parking Requirement	--	--	**3,270 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. For the purposes of calculating the minimum vehicle parking requirements, it is assumed that the gross leasable floor area ("GLFA") is equal to the GFA.
3. City of Pickering Zoning By-law 3036 does not provide rounding rules for the calculation of vehicle parking requirements. As such, parking calculations resulting in a fraction have been rounded to the nearest whole number (i.e., greater than or equal to 0.5 will be rounded up and calculations resulting in a fraction less than 0.5 will be rounded down).

Application of the subject vehicle parking requirements results in a minimum of 3,270 vehicular parking spaces, including 3,059 combined resident and residential visitor parking spaces and 211 retail parking spaces.

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the number of accessible parking spaces based on the proposed parking supply. As such, the accessible parking requirement for the site is discussed in **Section 5.3**.

5.2 Latest Vehicle Parking Standards

5.2.1 City of Pickering Draft Comprehensive Zoning By-law

Following the review of the new Official Plan and proposed Official Plan Amendment 38 (“OPA 38”), City staff are currently completing a comprehensive Zoning By-law Review, with the primary objective of amalgamating and updating the City's existing six (6) parent Zoning By-laws, including Zoning By-law 3036. The City is currently in Phase 3 of the study, where the Final Draft of the Zoning By-law has been released in October 2024.

The City of Pickering’s Draft Comprehensive Zoning By-law currently proposes minimum parking standards for “City Centre” and “Other Areas of the City”. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development.

A summary of the minimum vehicle parking requirements for the site, as per the City’s Draft Comprehensive Zoning By-law for the “All Other Zones” area, applying weekday and weekend shared parking, is provided in **Table 6** and **Table 7**, respectively.

Table 6 City of Pickering Draft Comprehensive Zoning By-law “All Other Zones” Minimum Parking Requirements (Weekday Shared Parking)

Use	Units/ GFA[1,2]	Minimum Rate	Minimum Req. Before Sharing[3]	Shared Parking (AM)[4]	Shared Parking (Noon)[4]	Shared Parking (PM)[4]	Shared Parking (Eve)[4]
Apartment Dwelling	1,748 units	1.25 spaces / unit	2,185 spaces	100% (2,185 spaces)	100% (2,185 spaces)	100% (2,185 spaces)	100% (2,185 spaces)
Resident Subtotal	--	--	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*
Residential Visitor	1,748 units	0.25 spaces / unit	437 spaces	20% (87 spaces)	20% (87 spaces)	60% (262 spaces)	100% (437 spaces)
Retail[2]	3,922 m^2	4.5 spaces / 100 m^2 GLFA	176 spaces	65% (114 spaces)	90% (158 spaces)	90% (158 spaces)	90% (158 spaces)
Non-Resident Subtotal	--	--	*613 spaces*	*201 spaces*	*245 spaces*	*420 spaces*	*595 spaces*
Total Vehicle Parking Requirement	--	--	**2,798 spaces**	**2,386 spaces**	**2,430 spaces**	**2,605 spaces**	**2,780 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. For the purposes of calculating the minimum parking requirements, it is assumed that the gross leasable floor area (GLFA) is equal to the GFA.
3. As per Section 5.3.1 of the City of Pickering Draft Comprehensive Zoning By-law 3036, parking calculations resulting in a fraction shall be rounded down to the nearest whole number.
4. Morning (“AM”)
Noon (“Noon”)
Afternoon (“PM”)
Evening (“Eve”)

Table 7 City of Pickering Draft Comprehensive Zoning By-law “All Other Zones” Minimum Parking Requirements (Weekend Shared Parking)

Use	Units/ GFA[1,2]	Minimum Rate	Minimum Req. Before Sharing[3]	Shared Parking (AM)[4]	Shared Parking (Noon)[4]	Shared Parking (PM)[4]	Shared Parking (Eve)[4]
Apartment Dwelling	1,748 units	1.25 spaces / unit	2,185 spaces	100% (2,185 spaces)	100% (2,185 spaces)	100% (2,185 spaces)	100% (2,185 spaces)
Resident Subtotal	--	--	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*	*2,185 spaces*
Residential Visitor	1,748 units	0.25 spaces / unit	437 spaces	20% (87 spaces)	20% (87 spaces)	60% (262 spaces)	100% (437 spaces)
Retail[2]	3,922 m^2	4.5 spaces / 100 m^2 GLFA	176 spaces	80% (140 spaces)	100% (176 spaces)	100% (176 spaces)	70% (123 spaces)
Non-Resident Subtotal	--	--	*613 spaces*	*227 spaces*	*263 spaces*	*438 spaces*	*560 spaces*
Total Vehicle Parking Requirement	--	--	**2,798 spaces**	**2,412 spaces**	**2,448 spaces**	**2,623 spaces**	**2,745 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. For the purposes of calculating the minimum parking requirements, it is assumed that the gross leasable floor area (GLFA) is equal to the GFA.
3. As per Section 5.3.1 of the City of Pickering Draft Comprehensive Zoning By-law 3036, parking calculations resulting in a fraction shall be rounded down to the nearest whole number.
4. Morning (“AM”)
Noon (“Noon”)
Afternoon (“PM”)
Evening (“Eve”)

Application of the City of Pickering Comprehensive Zoning By-law for “All Other Zones” results in a total requirement of 2,780 vehicle parking spaces, including 2,185 resident parking spaces and 595 shared non-resident parking spaces. This total is representative of the weekday evening period which yields the highest time of day parking requirement across both weekdays and weekends.

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the number of accessible parking spaces based on the proposed parking supply. As such, the accessible parking requirement for the site is discussed in **Section 5.3**.

5.3 Proposed Vehicle Parking Standards

Given the significant transit and active transportation-related improvements anticipated within the immediate area and along the Kingston Road corridor, it is proposed to adopt reduced minimum vehicle parking standards to the site. A summary of the proposed (recommended) minimum parking standards is provided in **Table 5**.

Table 8 Proposed Minimum Parking Requirements

Use	Units/GFA/Category[1,2]	Minimum Rate	Minimum Requirement[3]
Apartment Dwelling	1,748 units	0.65 spaces / unit	1,136 spaces
Resident Subtotal	--	--	*1,136 spaces*
Residential Visitor	1,748 units	0.20 spaces / unit	349 spaces
Non-residential (Retail)[2]	3,922 m^2	Inclusive of resident visitor rate	--
Non-Resident Subtotal	--	--	*349 spaces*
Total Vehicle Parking Requirement	--	--	**1,485 spaces**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. For the purposes of calculating the minimum vehicle parking requirements, it is assumed that the gross leasable floor area ("GLFA") is equal to the GFA. In addition, the non-residential uses listed below are to be inclusive of the proposed resident visitor rate.
3. As per Section 5.3.1 of the City of Pickering Draft Comprehensive Zoning By-law 3036, parking calculations resulting in a fraction shall be rounded down to the nearest whole number.

Application of the proposed minimum standards results in a total requirement of 1,485 vehicle parking spaces, including 1,136 resident parking spaces and 349 shared non-resident parking spaces.

Despite the resident visitor and retail uses currently proposed as part of the development plan, the Draft Site-specific Zoning By-law indicates that the shared non-resident parking supply rate of 0.20 spaces per unit will serve the following range of uses:

- Residential Visitor;
- Day Care Centre;
- Financial Institution;
- Food Store,
- Personal Service Shop;
- Retail Store;
- Restaurant;
- Medical Office; and
- Temporary Sales Office.

5.4 Proposed Vehicle Parking Supply

The architectural plans illustrate the following vehicle parking supply to support the site:

- Resident: 1,138 spaces (approximately 0.65 spaces per unit)
- Shared non-resident: 350 non-resident spaces (approximately 0.20 spaces per unit)
- Total: 1,488 spaces (approximately 0.85 spaces per unit)

In addition, as part of the proposed parking supply, 50% of resident parking is designed to provide Electric Vehicle ("EV") parking spaces (i.e., 40% EV rough-ins and 10% EV-ready) and 20% of non-resident parking is designed to provide EV rough-in spaces, in accordance with the City's ISDS.

The vehicular parking spaces will be located on the P1, B2, B1, Ground Floor, and Podium Levels 2, 3, and 4 of the proposed development. Access to the vehicular parking spaces will be provided via two parking ramps which can both be accessed from the proposed site driveway, off the north-south public road.

It is recognized that the in-force minimum parking requirements of the City of Pickering Zoning By-law 3036 and the contemporary City of Pickering Draft Comprehensive Zoning By-law standards overstate the parking needs of contemporary developments in transit-accessible areas of Pickering, such as the site. **Section 5.5** discusses the appropriateness of the proposed (reduced) parking requirements of the site.

5.4.1 Accessible Parking

Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the required number of accessible parking spaces based on the proposed visitor (i.e., shared non-resident) parking supply. Based on the non-resident supply indicated in **Section 5.4**, a supply of 9 accessible parking spaces, including 4 Type A and 5 Type B spaces, is required. The minimum accessible parking requirement for the site is summarized in **Table 9**.

Table 9 Minimum Accessible Parking Requirement

Use	Category	Minimum Requirement[1]
Non-Resident Parking Supply	301 - 350 spaces	9 spaces (4 Type A and 5 Type B)

Notes:
1. Type 'A' spaces have a minimum width of 3.4 metres and a Type 'B' space has a minimum width of 2.4 metres.

The architectural plans illustrate a total of 19 accessible parking spaces, including 9 non-resident accessible spaces and 10 resident accessible spaces, which are located near the parking elevator lobbies on multiple parking levels. As such, the proposed accessible parking supply exceeds the minimum requirements.

5.5 Appropriateness of the Reduced Minimum Parking Standards

The City of Pickering, Durham Region, and the Province of Ontario actively promote lower levels of auto ownership through several initiatives, both from a policy perspective and through the investment of infrastructure to support alternative modes of transportation. This section summarizes the prevailing policies and site-specific factors which will influence auto ownership and parking demand for the subject site and reviews how the proposed parking standards compare to comparable Zoning By-law standards, proxy demands, and proxy approvals.

5.5.1 Context Considerations (Applicable to Resident and Non-resident Uses)

5.5.1.1 PROVINCIAL "CUTTING RED TAPE TO BUILD MORE HOMES ACT" (BILL 185)

As introduced in **Section 3.1.1**, the Provincial Government introduced the Cutting Red Tape to Build More Homes Act, 2024 (Bill 185) on April 10, 2024 which prohibits and / or limits the ability for municipal Official Plans and Zoning By-laws to require an owner to provide parking facilities (other than for bicycle parking) in PMTSAs.

Bill 185 received Royal Assent on June 6, 2024, and is now in force and effect. Although municipalities in Durham Region have identified MTSAs which are awaiting ministerial approval, they currently are limited to areas surrounding existing GO stations. The closest MTSA to the site is the Pickering GO PMTSA, which is located approximately 2.5 kilometres or a 15-minute bus ride from the site. Although the site is not located directly within an MTSA, there is great potential for the City to expands it MTSA zones to consider areas with future rapid transit access (e.g., along the Durham-Scarborough BRT corridor where the site is located) in conformance with other municipalities with comparable rapid transit services.

As such, while the site is not located within a designated MTSA by the City of Pickering, the site is located at a major intersection along a future rapid transit corridor, a future transit context that resembles the principles and elements of an MTSA. Therefore, while the site does not propose to provide zero vehicular parking, some degree of parking reduction may be considered appropriate for the site considering its location at a future stop along the Durham-Scarborough BRT.

5.5.1.2 EVOLVING OVERARCHING POLICY AND PLANNING REGIME

The overarching policy and planning regime, applicable to the site, guides the way in which the Province and its municipalities evolve and respond to changing transportation needs. Namely, they reflect initiatives, standards, and investments that prioritize active mobility and the experience of people over the efficiency of car movement. Recent plans and policies aim to mitigate and significantly reduce vehicle traffic through the promotion and facilitation of non-auto trips and the vast improvement of public transit access. As a result, contemporary planning is needed to reduce and manage parking as a key factor in mitigating challenges of vehicle traffic congestion, automobile dependency / usage, and other indirect (but equally as important) challenges, including the supply and affordability of housing.

Common themes across provincial and regional directives (e.g., 2024 Provincial Planning Statement and Durham Region Official Plan) as well as municipal plans (e.g., Pickering OP, Kingston Corridor Intensification Plan, and Pickering ITMP) emphasize the following transportation-related implications:

- **Planning transit from a network perspective.**

  Public transit in the site area and surrounding neighbourhood is being enhanced to achieve an interconnected network of high-order public transit service, overall offering a greater range of transportation options for residents and visitors.

- **Designing streets and public realms for people.**

  While the efficient movement of automobiles has previously been the focus in transportation planning, the enjoyment, safety, and efficiency of the pedestrian has become the primary focus of mobility planning throughout the City.

- **Connecting and expanding cycling infrastructure.**

  The City has been undertaking significant expansion of cycling infrastructure as adopted in the City of Pickering Integrated Transportation Master Plan, as well as cycling-supportive amenities (both publicly accessible and integrated with new developments).

- **Reduction of vehicle parking as appropriate.**

  Based on the above, the provincial and municipal governments have taken significant steps to address increasingly immediate housing needs, environmental concerns, and traffic congestion. One way in which the Region and City aim to tackle these concerns is consideration for the significant reduction or complete elimination of vehicle parking for new developments based on their proximity to transit. This approach is expected to better facilitate development approvals, reduce greenhouse gas emissions and single occupancy vehicle trips, and relieve congestion along major corridors with additional support through TDM measures.

Overall, the above themes have been fundamental to the development of the Region and City, which have and will continue to guide the planning / design and overall parking needs.

5.5.1.3 EVOLVING TRANSPORTATION CONTEXT

The existing and evolving transportation context of the site area further supports the reduction of private vehicle trips and, therefore, a reduction of parking ownership and usage on-site. While the site is currently served by existing GO and DRT bus service, including DRT PULSE service, the site will see significant improvements to transit accessibility as a result of the proposed Durham-Scarborough BRT, running adjacent to the site, along with significant investments in active transportation infrastructure.

The Durham-Scarborough BRT is a proposed rapid transit service extending from Scarborough Centre in Toronto to Downtown Oshawa, primarily along Kingston Road, with 49 proposed BRT stops across Toronto, Pickering, Oshawa, Whitby, and Ajax. The BRT is planned to include dedicated bus lanes, frequent and reliable bus service, and smart signals along Kingston Road, all of which will provide future site residents and visitors with the ability to travel more efficiently and conveniently across the City and nearby municipalities, whether it be for work or play. Based on discussion with Regional staff, it is anticipated that construction will start in 2025. As such, it is expected that future site users will be able to travel to / from the site via this new rapid transit corridor. It is expected that a future BRT stop will be located adjacent to the site, near the Kingston Road and Whites Road intersection.

In addition to the proposed BRT, the Metrolinx GO expansion will expand and electrify the GO rail network allowing for faster travel times and all-day, two-way service with significantly increased service frequencies (every 15 minutes or better), on most GO lines, including the Lakeshore East Line accessible from the site via Pickering GO Station. Based on the transit reach analysis, discussed in **Section 4.2.3**, the future transit improvements in the site area (including the DSBRT and GO Expansions), will allow for future site users to travel further in the Region within 15 minutes.

Further to transit improvements, the Durham Region Cycling Plan and Pickering ITMP have ambitious plans to provide a broader, connected cycling network throughout the Region, including cycling infrastructure along major roadways near the site, allowing for daily and / or recreational travel to be taken by bike rather than by private vehicle. Further, the Kingston Road Corridor and Specialty Retailing Node Intensification Plan proposes to create a pedestrian-oriented corridor along Kingston Road, focused on animating the public realm and creating more pedestrian destinations and interactions.

Overall, the site's location adjacent to a proposed rapid transit corridor supports a reduction in the site's vehicle parking supply as future site residents and visitors will be able to travel without the need for a private vehicle. Moreover, improvements to the pedestrian and cycling connectivity and experience in the site area will increase the viability and attractiveness of travel by active transportation over auto-travel.

5.5.2 Resident Parking

It is proposed to provide a resident supply of 0.65 spaces per unit for the overall development. As such, the resident parking standards of Zoning By-law 3036 overstate the practical needs of the proposed redevelopment, considering its evolving transportation context and additional site-related factors.

In addition to the several non-auto supportive regional and local plans and policy directives (discussed in **Section 5.5.1**) and evolving area transportation context afforded to the area (discussed in **Section 5.5.1**), a reduced resident parking standard is considered appropriate for the site based upon the following considerations:

- Observed precedence for resident parking reduction approvals in the Greater Toronto and Hamilton Area ("GTHA");
- Review of other residential parking By-law standards across Ontario;
- Observed parking sales data at condominiums in Pickering; and
- Support from the site's TDM strategy for residents.

5.5.2.1 OBSERVED RESIDENT PARKING REDUCTION APPROVALS

There is a demonstrated trend of resident parking reduction approvals being granted across the Region where developments with a comparable context to the site have sought relief from their as-of-right Zoning By-law requirement.

Table 10 provides a summary of these resident parking reduction approvals, including a summary of decreasing resident parking rate approvals in the GTHA and in the City of Pickering, both outside and within Pickering Town Centre ("PTC"). A detailed analysis of the resident parking reduction approval trends observed is further discussed in the following section.

Table 10 Resident Proxy Parking Reduction Approvals

Address	Nearby Transit Station (Approximate Distance from Site)[2]	Municipality	Approval Mechanism	Approved Resident Parking Rate
Site (705 Kingston Road)	Pickering GO Station (4.0 km walk / 15-min bus)	Pickering	--	Proposed Rate: 0.65 spaces / unit
689 The Queensway	Mimico GO Station (1.5 km walk / 11-min bus)	Etobicoke (Toronto)	Site Specific By-laws 680-2021	0.76 spaces / unit
1197 The Queensway Avenue & 8 Zorra Street	Mimico GO Station (3.0 km walk / 14-min bus)	Etobicoke (Toronto)	Site-specific By-law 886-2021	0.75 spaces / unit
1306-1310 The Queensway Avenue	Mimico GO Station (3.4 km walk/ 20-min bus)	Etobicoke (Toronto)	Site-specific By-laws 198-2022 & 199-2022	0.75 spaces / unit
3051 Cook Street	Cooksville GO Station (850 metres / 13-min walk)	Mississauga	CoA File: "A" 177/23 (August 17, 2023)	0.70 spaces / unit
395 City Centre Drive, 4225 and 4235 Confederation Parkway, and 4220 Living Arts Drive	City Centre Transit Terminal (1.1 km walk / 9-min bus)	Mississauga	CoA File: "A" 423/23 (December 14, 2023)	0.67 spaces / unit
325 Burnhamthorpe Road	City Centre Transit Terminal (1.1 km walk / 8-min bus)	Mississauga	CoA File: "A" 426/23 (November 9, 2023)	0.50 spaces / unit
1550 Kingston Road	Pickering GO Station (1.6 km walk / 10-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7553/17 (OMB) File PL 170549	0.80 spaces / unit
Lots 1, 2, 43 & 46, Plan 316 & Part of Lot 20, Concession 1 (Knob Hill Farms)	Pickering GO Station (2.1 km walk / 15-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7860/21	0.80 spaces / unit
Universal City 2 & 3 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering (PTC)	CoA Decision - P/CA 60/19	0.74 spaces / unit
Universal City 6 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering	City of Pickering Zoning By-law No. 7810/21	0.71 spaces / unit
Universal City 4 & 5 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering	City of Pickering Zoning By-law No. 7936/22	0.65 spaces / unit
Universal City 7 (Bayly St / Liverpool Rd)	Pickering GO Station (650 m walk / 9-min walk)	Pickering	City of Pickering Zoning By-law No. 7924/22	0.65 spaces / unit
1786-1790 Liverpool Road	Pickering GO Station (650 m walk / 9-min walk)	Pickering	Site specific By-law 8023/23	0.55 spaces / unit

Address	Nearby Transit Station (Approximate Distance from Site)[2]	Municipality	Approval Mechanism	Approved Resident Parking Rate
Observed Parking Approvals Range	--	--	--	**0.50 spaces / unit - 0.80 space / unit**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.
2. The bus travel times are approximate, based on the available service during the weekday peak period, and include the travel time of the entire bus journey (i.e., bus and walk).

The observed range and trends of resident parking approvals in comparable or slightly more progressive site locations indicate that the proposed resident rate for the site (0.65 spaces per unit) is generally suitable. The following presents the key themes derived from the resident approvals.

Declining Resident Parking Rates Throughout the GTHA

BA Group reviewed regional parking reduction approvals for recently built or approved residential developments in the City of Pickering, just outside of Pickering Town Centre ("PTC"). Specifically, sites were observed in Etobicoke (western end of Toronto) and Mississauga (outside of the City Centre) as the transportation and development / urban context is comparable to that of the site's location in Pickering (i.e., area that is at least a 10-minute bus journey from the nearest GO rail station and currently undergoing intensification / urbanization).

Overall, it is evident that resident parking rate approvals have continued to trend downwards as Etobicoke and Mississauga's population continues to grow and as the transit services levels continue to improve to support this recent urbanization. In Mississauga, between mid-2023 and late-2023, resident parking rate approvals were observed to decrease rapidly from 0.70 spaces per unit to 0.50 spaces per unit, largely due to reduced demand for parking in newly built residential developments within MTSAs. The proposed site resident rate of 0.65 spaces per unit falls within this range.

In Etobicoke, between 2019 and 2022, a resident parking rate reduction from 1.00 spaces per unit to 0.75 spaces unit was observed. It is anticipated that this trend will continue with progressively lower rates, particularly with the introduction of future transit and active transportation improvements including the GO expansion. Moreover, it is noted that new developments in Etobicoke today would be permitted to provide zero resident parking, as-of-right, as a result of City-wide parking policy changes to their comprehensive Zoning By-law. As such, the resident parking rate proposed for the subject site (0.65 spaces per unit) can be supported by the trends in regional parking approvals.

Rapidly Evolving Policy Context in the City of Pickering Within Areas Outside of the City Centre

For context, BA Group reviewed approved parking standards in the City of Pickering located outside of the City Centre. There are limited resident parking reduction approvals, especially recent approvals, due to the overall limited residential intensification thus far outside of the City Centre. Between 2017 and 2021, reduced resident parking rate approvals were granted at 0.80 spaces per unit, which represents significant relief from its subject Zoning By-law requirement of over 1.00 space per unit. While these parking rates are higher than that proposed for the site (i.e., 0.65 spaces per unit), the proposed resident parking standard presents an opportunity to set a new precedent as most of these approvals are considered outdated. In addition, more recent policies dated 2022 and later provide significant support for reduced rates, such as the Kingston Road Corridor and Specialty Retailing Node Intensification Plan, based on the area's rapidly transforming high-density and transit-oriented urban form.

Proposed Resident Parking Standard Relative to Declining Resident Parking Rates Within the Pickering Town Centre

Finally, BA Group reviewed parking approvals within the Pickering Town Centre and areas closer to the Pickering GO Station to understand the reduction in resident parking approvals over time as a result of improvements to transit service and growth in the City Centre. A review of these approvals shows a significant decline in resident parking rates over the last four (4) years.

From 2019 to 2023, there has been a rapid resident parking rate decline from 0.74 spaces per unit to 0.55 spaces unit. It is anticipated that this trend will continue with progressively lower rates, particularly with the future operation of the Durham-Scarborough BRT providing additional east-west rapid transit capacity, which conveniently extends past the site. The most recent reduced parking rate in PTC was approved in 2023 at 0.55 spaces per unit for a site (i.e., 1786-1790 Liverpool Road) located within a 10-minute walk of the Pickering GO Station. Given this, the proposed resident parking rate for the site (0.65 spaces per unit) should be considered appropriate considering its slightly greater distance from the Pickering Town Centre and GO Station (i.e., a 10-minute to 15-minute bus ride). Albeit the 2023 approval is now outdated considering recent provincial policy changes to vehicle parking requirements for MTSAs in mid-2024 (i.e., Bill 185).

5.5.2.2 RESIDENT BY-LAW STANDARDS

In addition to reductions in resident parking requirements from their applicable Zoning by-laws, BA Group has also conducted a review of as-of-right resident parking requirements observed in other municipalities within the Greater Toronto and Hamilton Area (GTHA). This review was undertaken to analyze the similarities of parking standards and urban contexts adopted in several municipalities across the GTHA with comparable urban contexts and (future) rapid transit accessibility to the site in the City of Pickering. Municipalities were selected based on key characteristics including density / intensification patterns and access to surface (i.e., bus or higher order) transit services.

Table 11 summarizes the review of resident parking standards by municipality. It is noted that the timing of each municipality's Zoning By-law review / update differs, and the latest existing or proposed (if supported by municipal staff) parking policies / standards have been considered in recognition of rapidly evolving mobility trends and objectives.

Table 11 Resident Parking Zoning By-law Standards

Municipality	Zoning By-law / Policy	Zone / Area	Parking Rate[3]
City of Pickering	Site (Proposed Rate)	--	0.65 spaces / unit
City of Pickering	By-law 3036	--	1.75 spaces / unit *(shared with residential visitor)*
City of Pickering	Draft By-law #2	All Other Zones	1.25 spaces / unit
City of Mississauga	By-law 0225-2007	Precinct 1	0.80 spaces / unit[1,2]
City of Mississauga	Reduced Residential Parking Along Hurontario LRT Corridor Study (Approved by City Staff)	Precinct 1a (Along LRT Corridor)	0.50 spaces / unit[1,2]
City of Brampton	By-law 270-2004	Queen Street / Hurontario-Main Street LRT Corridors	0.00 spaces / unit[1]
City of Toronto	By-law 569-2013	Parking Zone A / B	0.00 spaces / unit[1]
City of Vaughan	By-law 001-2021	MMU, HMU, CMU, GMU, EMU Zones (Along BRT Corridors)	0.80 spaces / unit[1,2]

Municipality	Zoning By-law / Policy	Zone / Area	Parking Rate[3]
Hamilton	By-law 05-200	Outside of Downtown	<50 m^2 - 0.30 spaces / unit >50 m^2 - 1.00 space / unit
Observed Zoning By-law Standards (Excluding Pickering)	--	--	**0.00 spaces / unit - 1.00 spaces / unit**

Notes:
1. Recognized as a suitable proxy for intensification areas in the City of Pickering with access to the future Durham-Scarborough BRT.
2. The royal passing of Bill 185 in June 2024 indicates that no minimum vehicle parking requirements apply within designated and approved Major Transit Station Areas.

The observed range of overall standards, which includes permissions for no minimum resident parking, demonstrates that the proposed resident rate of 0.65 spaces per unit fits well within the region-wide requirements for areas in proximity to rapid transit, namely the BRT and LRT. Furthermore, while Mississauga, Vaughan, and Brampton are leading municipalities to the City of Pickering, **Table 11** reports the parking standards applicable in comparable existing and/or future transit contexts to the site that are not necessarily located within the "downtown" or "city centre" areas, as outlined below:

- City of Pickering: Future Durham-Scarborough BRT (Intensification Areas along Kingston Road corridor)
- City of Mississauga: Future Hurontario LRT (Precinct 1 / higher density along Hurontario Street corridor with recognized Major Transit Station Areas within and outside of the City Centre area)
- City of Vaughan: Existing Viva BRT (Higher density along Highway 7 and Yonge Street corridors with recognized Major Transit Station Areas within and outside of the Vaughan Metropolitan Centre area)
- City of Brampton: Future Hurontario LRT (Higher density along Queen Street and Main Street corridors with recognized Major Transit Station Areas within and outside of the Downtown area)

It is further noted that the many of the municipalities reviewed (e.g., Mississauga, Vaughan, and Brampton) are now subject to the changes implemented by Bill 185 as they have designated and approved PMTSAs. Therefore, no minimum parking, including resident parking, is permitted. Although the site is not located directly within an MTSA, there is great potential for the City to expands it's MTSA zones to consider areas with future rapid transit access (e.g., along the DSBRT corridor where the site is located) in conformance with other municipalities with comparable rapid transit services such as the Hurontario LRT in Brampton. As such, while the site is not proposing "no minimum" resident parking, this review of comparable resident parking standards indicates that some form of parking reduction is appropriate.

5.5.2.3 PARKING SALES DATA (PICKERING TOWN CENTRE)

By way of comparison, BA Group has also reviewed condominium parking sales information for five (5) sites within the PTC (Universal City). **Table 12** summarizes this parking sales information for Universal City.

Table 12 Universal City Condominiums Parking Sales Data Summary (March 2023)

Location	% Units Sold	Resident Parking Supply	Current Parking Sold	Current Unsold Parking Spaces
Universal City 1	100% (275 units)	223 spaces (0.81 spaces / unit)	216 spaces (0.79 spaces / unit)	7 spaces
Universal City 2	100% (336 units)	271 spaces (0.81 spaces / unit)	248 spaces (0.74 spaces / unit)	23 spaces
Universal City 3	96% (357 units)	277 spaces (0.78 spaces / unit)	257 spaces (0.72 spaces / unit)	20 spaces
Universal City 6	95% (306 units)	230 spaces (0.72 spaces / unit)	185 spaces (0.58 spaces / unit)	45 spaces
The Grand	44% (211 units)	324 spaces (0.67 spaces / unit)	107 spaces (0.51 spaces / unit)	217 spaces

Notes:
1. Unit and parking spaces sales based on data provided by Unique AT Management Inc. in March 2023.
2. Based on the number of spaces and units sold at the time that the sales data was recorded.

A review of the recorded parking sales information for the first phases of the Universal City development indicates that demand for parking spaces was well below the existing Zoning By-law 3036 combined resident and residential visitor parking requirement of 1.75 spaces / unit and well below the Draft Comprehensive Zoning By-law resident parking requirement of 1.25 spaces per unit. In addition, a declining trend in parking sold is observed from the first few development blocks of Universal City to the most recent development block with an uptake rate of 0.51 spaces per unit. Overall, the rate of sold parking declines from 0.79 spaces per unit to 0.51 spaces per unit.

While the subject site is not located in the Pickering Town Centre, the decreasing resident parking trends discussed above are still applicable considering the site's location in a fast-growing / fast-developing area with access to a future rapid transit corridor. While the most recent parking sales data for Universal City indicates a rate of 0.51 spaces per unit, the subject site is located approximately 2.5 kilometres from the western boundary of the City Centre. We anticipate that parking demand will gradually increase as the distance from the City Centre increase. Therefore, the proposed resident rate of 0.65 spaces per unit considers the site's distance from the City Centre and is considered appropriate.

5.5.2.4 PROPOSED RESIDENT-BASED TDM STRATEGIES

As presented in **Section 9.0**, a comprehensive TDM Plan has been developed for the site, which is encouraged to help achieve sustainability goals pertaining to reduced greenhouse gas emissions within the transportation sector. The primary objectives of this strategy, for the purposes of reducing the carbon footprint for the proposed development, include reducing automobile dependence and reliance on single-occupancy vehicle travel, supporting walking and cycling as alternative modes of travel, and promoting transit and active transportation to automobile ownership as viable options for travel.

Key elements of the TDM strategy for residents include (but are not limited to) the following:

- Provision of reduced resident parking with unbundled spaces (i.e., sold separately from new units);
- Provision of at-grade retail uses on Kingston Road to generate more internalized on-foot trips (as opposed to using a vehicle);
- Provision of enhanced and direct connections between the internal and existing pedestrian network (as well as transit stops);
- Provision of on-site pick-up / drop-off facilities near each proposed building; and
- Provision of on-site bicycle parking and bicycle repair stations.

The proposed development has offered a variety of tools for residents to navigate through the mixed-use development and explore non-auto trip options to and from the site.

5.5.3 Non-Resident Parking

It is proposed to provide a shared non-resident parking supply of 0.20 spaces per unit. As such, the proposed non-resident standards of Zoning By-law 3036 overstate the actual parking needs of the proposed redevelopment, considering its evolving transportation context and additional site-related factors.

In addition to the several non-auto supportive regional and local plans and policy directives (discussed in **Section 5.5.1**) and evolving area transportation context afforded to the area (discussed in **Section 5.5.1**), a reduced non-resident parking standard for the site is considered appropriate based upon the following considerations:

- Observed precedence for reduced resident visitor parking reduction approvals in the Greater Toronto and Hamilton Area (GTHA);
- Review of resident visitor parking demands in similar context areas;
- Ancillary nature and impact of the proposed non-residential use;
- Non-resident parking sharing permissions as per the City of Pickering Draft Comprehensive Zoning By-law; and
- Support from the site's TDM strategy for non-resident uses.

5.5.3.1 OBSERVED RESIDENTIAL VISITOR PARKING APPROVALS

There is a demonstrated trend of resident visitor parking reduction approvals being granted across the GTHA where developments with a comparable context to the site have sought relief from their as-of-right Zoning By-law requirement.

Table 13 summarizes the resident apartment parking approvals sought by each municipality, including those within the City of Pickering, outside of the PTC.

Table 13 Resident Visitor Proxy Parking Reduction Approvals

Address	Nearby Transit Stop (Approximate Distance from Site)	Municipality	Approval Mechanism	Approved Resident Visitor Rate
Site (705 Kingston Road)	Pickering GO Station (4.0 km walk / 15-min bus)	Pickering	--	Proposed Rate: 0.20 spaces / unit *(combined residential visitor and retail)*
1550 Kingston Road	Pickering GO Station (1.6 km walk / 10-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7553/17 (OMB) File PL 170549	0.15 spaces / unit
Lots 1, 2, 43 & 46, Plan 316 & Part of Lot 20, Concession 1 (Knob Hill Farms)	Pickering GO Station (2.1 km walk / 15-min bus)	Pickering (Outside of PTC)	Site-specific By-law 7860/21	0.15 spaces / unit
1899 Brock Road	Pickering GO Station (2.3 km walk / 17-min bus)	Pickering (Outside of PTC)	Planning & Development Committee Report dated June 6, 2022 (Approved by City Staff)	0.15 spaces / unit

Address	Nearby Transit Stop (Approximate Distance from Site)	Municipality	Approval Mechanism	Approved Resident Visitor Rate
1970 Brock Road	Pickering GO Station (2.9 km walk / 11-min bus)	Pickering (Outside of PTC)	Site-specific By-law 8006/23	0.15 spaces / unit
2 & 4 Hanover Road	Bramalea GO Station (4.4 km walk / 20-min bus)	Brampton	Site-specific By-law 048-2020	0.14 spaces / unit
499 Main Street South	Bramalea GO Station (3.8 km walk / 17-min bus)	Brampton	Site-specific By-law 228-2020	0.15 spaces / unit
70 Mississauga Road South	Port Credit GO Station (1.4 km walk / 12-min bus)	Mississauga	CoA Decision A226.21 (June 24, 2021)	0.15 spaces / unit
180 Rutledge Road	Streetsville GO Station (1.1 km walk / 15-min walk)	Mississauga	CoA Decision A185.23 (June 22, 2023)	0.15 spaces / unit
1381 Lakeshore Road East	Long Branch GO Station (1.2 km walk / 7-min bus)	Mississauga	CoA Decision A401.23 (November 16, 2023)	0.15 spaces / unit
21-51 Queen Street North	Streetsville GO Station (2.1 km walk / 14-min bus)	Mississauga	OLT Case OLT-22-004676 (OLT Order: April 12, 2024)	Greater of: 0.13 spaces / unit or 4.3 spaces / 100 m^2
784 The Queensway Avenue	Mimico GO Station (1.5 km walk / 12-min bus)	Etobicoke (Toronto)	Site-specific By-law 312-2018	0.15 spaces / unit
225 Birmingham Street	Mimico GO Station (2.7 km walk / 25-min bus)	Etobicoke (Toronto)	Site-specific By-law 1800-2019 & 1801-2019	0.15 spaces / unit
1197 The Queensway Avenue & 8 Zorra Street	Mimico GO Station (3.0 km walk / 14-min bus)	Etobicoke (Toronto)	Site-specific By-law 886-2021	0.15 spaces / unit
1001, 1007, 1011 & 1037 The Queensway Avenue	Mimico GO Station (2.4 km walk / 12-min bus)	Etobicoke (Toronto)	Site-specific By-law 212-2022(OLT) OLT Case PL171317	0.15 spaces / unit
1306-1310 The Queensway Avenue	Mimico GO Station (3.4 km walk / 20-min bus)	Etobicoke (Toronto)	Site-specific By-laws 198-2022 & 199-2022	0.15 spaces / unit
Observed Parking Approvals Range	--	--	--	**0.13 spaces / unit - 0.15 spaces / unit**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.
2. The bus travel times are approximate, based on the available service during the weekday peak period, and include the travel time of the entire bus journey (i.e., bus and walk).

The recent, observed resident visitor parking approvals in comparable site locations range from 0.13 spaces per unit to 0.15 spaces per unit. It is noted that the observed developments in Pickering, outside of the City Centre, have been approved for residential visitor parking rates of 0.15 spaces per unit as well.

Overall, the site proposes to provide a combined non-resident parking rate of 0.20 spaces per unit, however, it is assumed that the majority of this parking will be utilized by residential visitors as the retail use on-site is considered ancillary, discussed further in **Section 5.5.3.3** and **Section 5.5.3.4**. Therefore, the proposed rate of 0.20 spaces per unit is generally suitable as it aligns with the observed resident visitor approvals of 0.15 spaces per unit, leaving the remaining parking to serve the ancillary retail uses, when necessary.

5.5.3.2 OBSERVED RESIDENTIAL VISITOR PARKING DEMAND

In comparison to the City of Pickering Zoning By-law 3036, recent residential visitor parking demands have been observed for other municipalities across the GTHA with comparable urban contexts and (future) rapid transit accessibility to the City of Pickering along the Kingston Road corridor. Municipalities were selected based on key characteristics including density / intensification patterns, access to surface (i.e., bus or higher order) transit services, and non-downtown locations.

Table 14 summarizes the resident visitor parking demand survey results by municipality.

Table 14 Resident Visitor Proxy Parking Demand

Address	Municipality	Survey Details[1]	Units[2]	Peak Resident Visitor Demand[3]	Peak Resident Visitor Demand Rate
2570-2590 Argyle Road	Mississauga (Outside City Centre)	October 2019	253 units	34 spaces	0.14 spaces / unit
1840-1850 Bloor Street	Mississauga (Outside City Centre)	October 2019	334 units	32 spaces	0.10 spaces / unit
5023 & 5025 Four Springs Avenue	Mississauga (Outside City Centre)	February 2020	438 units	57 spaces	0.13 spaces / unit
55 & 75 Eglinton Avenue West	Mississauga (Outside City Centre)	February 2020	461 units	54 spaces	0.12 spaces / unit
2645 Battleford Road	Mississauga (Outside City Centre)	October - November 2023	139 units	18 spaces	0.13 spaces / unit
1185 The Queensway Avenue	Etobicoke (Toronto)	September 2019	303 units	39 spaces	0.13 spaces / unit
Observed Parking Demand Range	--	--	--	--	**0.10 spaces / unit - 0.14 spaces / unit**

Notes:
1. The residential buildings in this table include both apartment and condominium buildings.

The observed peak residential visitor parking demands in comparable site locations range from 0.10 spaces per unit to 0.14 spaces per unit.

Overall, the site proposes to provide a combined non-resident parking rate of 0.20 spaces per unit, however, it is assumed that the majority of this parking will be utilized by residential visitors as the retail use on-site is considered ancillary, discussed further in **Section 5.5.3.3** and **Section 5.5.3.4**. Therefore, the proposed rate of 0.20 spaces per unit is generally suitable as it exceeds the visitor parking demand observed recently in areas of similar context.

5.5.3.3 ANCILLARY NATURE OF PROPOSED NON-RESIDENT USE

The proposed retail and permitted non-resident uses on-site are expected to provide ancillary-level service, as opposed to destination service, where prospective customers are expected to be local or on-site residents. Additionally, the current non-resident (retail) GFA on-site is proposed as numerous, smaller units that are expected to have faster turnover rates of trips compared to a larger, consolidated space. Overall, it is understood that the intent of the current proposed retail use is to primarily serve locals and to facilitate an active streetscape along Kingston Road.

In this way, it assumed that all or most retail or non-resident-related trips of this scale would be internal or by active transportation, generating minimal vehicle-based trips, especially by patrons or visitors that would largely require the use of a parking space on-site. Further, recognizing that the site is a mixed-use residential development and that the site area is expected to see significant transit and active transportation improvements in the future, it is expected that trips taken by visitors in the area will likely be generated on-foot, by transit, or by cycling.

As such, the combined non-resident parking rate of 0.20 spaces per unit is considered appropriate, especially as the proposed retail use on-site is anticipated to generate minimal vehicle-based trips and parking demand.

5.5.3.4 NON-RESIDENT SHARING PERMISSIONS AS PER CITY OF PICKERING DRAFT ZONING BY-LAW #2

The City of Pickering Draft Comprehensive Zoning By-law introduced sharing permissions for non-resident parking uses (e.g., residential visitor and retail uses) which was not previously permitted as per Zoning By-law 3036. The observed residential visitor parking approvals summarized in **Section 5.5.3.1** largely reflect an approved rate of approximately 0.15 spaces per unit. As such, the proposed site non-resident parking supply of 0.20 spaces per unit can fully support the observed residential visitor rate, plus the remaining supply to support the retail or other specified non-residential uses on-site, recognizing the sharing patterns and permissions reported in the Draft Comprehensive Zoning By-law. As part of the current development program, minimal retail parking during the peak hour is anticipated, as it is intended to be split into multiple smaller sized units, as discussed in **Section 5.5.3.3**.

5.5.3.5 PROPOSED NON-RESIDENT-BASED TDM STRATEGIES

Similar to the resident use, a variety of TDM measures have been offered for prospective visitors of the site. The following strategies have been proposed, including but not limited to the following:

- Provision on-site pick-up / drop-off facilities near each proposed building;
- Provision of an on-site bicycle parking supply that exceeds the minimum as-of-right Zoning By-law requirements; and
- Provision and maintenance of safe and convenient pedestrian facilities along the frontages of the site to increase access to services, amenities, and transit (e.g., Kingston Road).

The proposed development has offered a variety of tools for all types of users to navigate through the mixed-use development and explore non-auto trip options to and from the site. The site’s optimal location is a leading factor in which can drive travel behavior towards alternative, sustainable modes of transportation.

5.6 Vehicle Parking Summary

Based on a review of the as-of-right and evolving vehicle parking standards for the resident, resident visitor, and retail uses, it is evident that the site area within the City of Pickering has the opportunity to reduce the minimum standards and supply. As such, the following vehicle parking supply rates are proposed:

- Resident: 0.65 spaces per unit
- Shared non-resident: 0.20 spaces per unit

Recognizing the rapidly evolving policy and transportation contexts, observed widespread parking standards, parking demands, and approvals associated with suitable proxy sites across the Region (all of which are gradually declining over time), it is considered appropriate to adopt progressive standards that support the broad direction of other municipalities with respect to planned higher-order transit access and intensification. **Table 15** provides a summary of key parking findings as a result of the parking assessment. Overall, the proposed parking supply is considered appropriate for the site.

Table 15 Appropriateness of the Proposed Parking Standards – Assessment Summary

Category	Resident	Resident Visitor	Retail
Proposed Standard	**0.65 spaces / unit**	**0.20 spaces / unit**	**Shared with resident visitor standard**
Pickering Zoning By-law 3036 Standard	1.75 spaces / unit	Inclusive of resident standard	5 spaces / 93 m^2 GLFA
Pickering Draft Zoning By-law Standard	1.25 spaces / unit	0.25 spaces / unit	4.50 spaces / 100 m^2 GLFA
Observed Region-wide Proxy Zoning By-law Standards / Policies	0.00 - 1.00 spaces / unit	--[1]	--[1]
Observed Region-wide Proxy Parking Demands	--[1]	0.10 - 0.14 spaces / unit	--[1]
Observed Region-wide Proxy Parking Approvals	0.50 - 0.80 spaces / unit	0.13 - 0.15 spaces / unit	--[1]
Observed Pickering Parking Sales Data	0.51 - 0.79 spaces / unit	--[1]	--[1]

Category	Resident	Resident Visitor	Retail
Additional Considerations	• Evolving policy and transportation context in support of reduced parking through TDM, transit-oriented development, complete street design, and transit and active transportation infrastructure • Observed decline in Region-wide parking approvals, demand, and sales over time • Proposed TDM measures, such as unbundled parking, pre-loaded transit passes, enhanced pedestrian and cycling connections, bicycle parking and amenities, pick-up / drop-off facilities	• Evolving policy and transportation context in support of reduced parking through TDM, transit-oriented development, complete street design, and transit and active transportation infrastructure • Observed decline in Region-wide parking approvals, demand, and sales over time • Shared non-resident parking permissions adopted by the City • Proposed TDM measures, such as enhanced pedestrian and cycling connections, bicycle parking and amenities, pick-up / drop-off facilities	• Evolving policy and transportation context in support of reduced parking through TDM, transit-oriented development, complete street design, and transit and active transportation infrastructure • Nature of proposed retail uses is intended to encourage internal (non-auto) trips • Shared non-resident parking permissions adopted by the City • Proposed TDM measures, such as enhanced pedestrian and cycling connections, bicycle parking and amenities, pick-up / drop-off facilities

Notes:
1. Information not applicable or observed.

6.0 BICYCLE PARKING

6.1 Subject Zoning By-law Bicycle Parking Requirements

6.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to City of Pickering Zoning By-law 3036 (as amended) which does not specify minimum bicycle parking requirements.

6.2 Proposed Bicycle Parking Standards

6.2.1 City of Pickering Draft Comprehensive Zoning By-law and Integrated Sustainable Design Standards

The City of Pickering Draft Comprehensive Zoning By-law provides city-wide bicycle parking standards that are consistent with the latest bicycle parking standards in the City's ISDS for Tier 1. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. **Table 16** summarizes the proposed minimum bicycle parking requirements for the site.

Table 16 City of Pickering Draft Comprehensive Zoning By-law and Integrated Sustainable Design Standards (Tier 1) Minimum Bicycle Parking Requirements

Use	Units / GFA[1]	Minimum Rate[2]	Minimum Requirement[3]
Apartment Dwelling (Long-term)	1,748 units	0.50 spaces / unit	874 spaces
Apartment Dwelling (Short-term)	1,748 units	0.10 spaces / unit	174 spaces
Resident Subtotal	--	--	*1,048 spaces*
Retail (Long-term)	3,922 m^2	Greater of 2 spaces or 1 space / 1,000 m^2 gross leasable floor area or portion thereof	4 spaces
Retail (Short-term)	3,922 m^2	1 bicycle parking rack	1 bicycle parking rack
Non-Resident Subtotal	--	--	*4 spaces and 1 bicycle parking rack*
Long-term Requirement	--	--	**878 spaces**
Short-term Requirement	--	--	**174 spaces and 1 bicycle parking rack**
Total Bicycle Parking Requirement	--	--	**1,052 spaces and 1 bicycle parking rack**
Total Electric Bicycle Parking Requirement (Apartment Dwellings)[4]	--	**Greater of 1 space or 15% of required long-term spaces**	**131 spaces**

Notes:

1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. For the purposes of calculating the minimum bicycle parking requirements, it is assumed that the gross leasable floor area (GFLA) is equal to the GFA.
3. City of Pickering Draft Comprehensive Zoning By-law Section 5.3.1.1 states that where parking spaces are calculated by gross leasable area, or similar calculation, and the required parking is a fraction, the number of parking spaces shall be rounded down to the nearest whole number.

4. City of Pickering Draft Comprehensive Zoning By-law Section 5.13.1.7 states that for Apartment Dwellings, a minimum of 15% of the required long-term bicycle parking spaces, or 1.0 parking space, whichever is greater, shall include an energized 120-volt outlet adjacent to the bicycle rack or parking space.

Application of Draft Comprehensive Zoning By-law and Integrated Sustainable Development Guidelines (Tier 1) standards to the proposed development results in a minimum bicycle parking requirement of 878 spaces for the long-term use and 174 spaces and 1 bicycle parking rack for the short-term use. As part of this requirement, 15% of the long-term resident bicycle spaces are to be designated as electric.

City of Pickering Draft Zoning By-law Section 5.13.1 states that where the number of bicycle parking spaces exceeds 50 spaces, a minimum of 25% of the total required must be located within a building or structure, secure area, or bicycle lockers. All required bicycle parking should be provided on the same lot or may be located off-site within 100 metres from the building. In addition, a maximum of 50% of the bicycle parking requirement may be vertical spaces and the remaining required spaces are to be horizontal spaces.

Section 5.13.2 states the following minimum bicycle parking dimensions:

- Horizontal bicycle parking spaces: length of 1.8 metres and width of 0.6 metres
- Vertical bicycle parking spaces: length of 1.5 metres and width of 0.5 metres

6.3 Proposed Bicycle Parking Supply and Facilities

The architectural plans illustrate a supply of 1,056 bicycle parking spaces, including 880 long-term spaces and 176 short-term spaces.

The long-term resident bicycle parking is provided on Levels B1 and P1, which may be accessed from the building elevators located at-grade. The short-term resident bicycle parking is provided on Level B2 and may be accessed from publicly accessible building entrances / elevators and the external network. All retail bicycle parking is provided on Level B2.

Also, 15% of the required long-term resident bicycle spaces are designated as electric.

The proposed bicycle parking supply exceeds the minimum recommended requirements and provides ample opportunities for future cyclists of the proposed development.

7.0 LOADING

7.1 Subject Zoning By-law Loading Requirements

7.1.1 City of Pickering Zoning By-law 3036

The site is primarily subject to the City of Pickering Zoning By-law 3036 (as amended) loading standards, which result in no minimum requirement.

7.2 Proposed Loading Standards

7.2.1 City of Pickering Draft Comprehensive Zoning By-law

The City of Pickering Draft Comprehensive Zoning By-law provides city-wide loading standards. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, for comparison purposes, there are no minimum requirements for the proposed development. However, City of Pickering Draft Zoning By-law Section 5.14.1 states that loading activity shall be provided and maintained on the same lot of the principal use. Section 5.14.2 further states the following minimum dimensions:

- Width of 3.5 metres
- Length of 12.0 metres
- Vertical clearance of 4.2 metres

The minimum vertical clearance shall be 7.0 metres for garbage collection vehicles, as governed by Durham Region Waste Collection By-law 46-2011.

It is proposed to adopt the minimum dimensions stated by the City of Pickering.

7.2.2 City of Toronto Comprehensive Zoning By-law 569-2013

Since the City's Draft Comprehensive Zoning By-law currently does not indicate any specific minimum loading requirements, it is appropriate to consider the practical needs of the site based upon a review of a nearby municipality with progressive loading standards within an urban context. For comparison purposes, **Table 17** summarizes the City of Toronto Comprehensive Zoning By-law 569-2013 loading standards applied to the proposed development, per building.

Table 17 Toronto Zoning By-law 569-2013 Loading Requirements

Building	Use/s	GFA / Units[1]	Category	Minimum Requirement (After Sharing)[2,3]
Building 1	Residential, Retail	316 units, 1,106 m^2	0 - 399 units, 500 - 1,999 m^2	1 Type G
Building 2	Residential, Retail	376 units, 1,683 m^2	0 - 399 units, 500 - 1,999 m^2	1 Type G
Building 3	Residential	330 units	0 - 399 units	1 Type G
Buildings 4 and 5 (including Podium)	Residential, Retail	726 units, 1,133 m^2	400+ units, 500 - 1,999 m^2	1 Type G, 1 Type C

Building	Use/s	GFA / Units[1]	Category	Minimum Requirement (After Sharing)[2,3]
Total Loading Requirement (After Sharing)	--	--	--	**4 Type G, 1 Type C**

Notes:
1. Site statistics received from BDP Quadrangle Architects Ltd. dated October 31, 2024.
2. City of Toronto Comprehensive Zoning By-law 569-013 Section 220.5.10.1 (9) and 40.10.90.1) sharing provisions have been applied.
3. City of Toronto Comprehensive Zoning By-law 569-2013 Section 220.5.1.10 (8) states that Type G spaces typically facilitate garbage/refuse collection and require a minimum length of 13.0 metres, minimum width of 4.0 metres, and minimum vertical clearance of 6.1 metres. Type C spaces facilitate retail and residential move-in/out activity require a minimum length of 6.0 metres, minimum width of 3.5 metres, and minimum vertical clearance of 3.0 metres.

Application of the City of Toronto Comprehensive Zoning By-law standards (after adopting all applicable shared loading clauses) results in a minimum loading requirement of 4 Type G spaces (used for waste / garbage collection purposes) and 1 Type C space (used for residential moving purposes).

As a practical and conservative approach, it is proposed to adopt the minimum number of spaces required by the City of Toronto.

7.3 Proposed Loading Supply and Facilities

The architectural plans illustrate a loading supply of 5 loading spaces, including 4 loading spaces for residential waste collection / retail purposes for all buildings and 1 additional loading space for residential moving activity to support the combined number of units in Buildings 4 and 5.

Appropriate bin staging areas are proposed at the loading facilities of the buildings based on the City of Toronto's Waste Management Guidelines.

The waste collection and retail loading spaces meet the minimum dimensions outlined by the City of Pickering and Durham Region Waste Collection By-law 46-2011 (i.e., 3.5 metre width by 12.0 metre length by 7.0 metre vertical clearance). The additional residential move-in and move-out loading space will meet the minimum dimensions outlined by the City of Toronto (i.e., 3.5 metre width by 6.0 metre length by 3.0 metre vertical clearance). **Appendix E** illustrates the vehicle maneuvering diagrams for the front-end waste collection and cube van vehicles entering and exiting the site in an acceptable manner for the respective loading spaces.

The proposed loading supply meets the recommended minimum requirements and accommodates the expected moving and refuse collection activity for the buildings of the proposed development.

8.0 PICK-UP AND DROP-OFF

The emergence and convenience of auto-based shared mobility services, including car-share, taxi, and ride-hailing services (e.g., Uber and Lyft), and general carpooling, have rapidly grown in recent years and are being utilized as an increasingly suitable alternative for private vehicle ownership or single-occupancy vehicle travel. Furthermore, the increased use in auto-based shared mobility services is often being observed in more central urbanized areas, including evolving intensification areas or mixed-use corridors in the City of Pickering (e.g., along several major intersections and corridors with frequent heavy traffic).

While not required by the Zoning By-law, passenger pick-up / drop-off facilities are proposed on the site in the form of a highly visible pick-up / drop-off loop and short-term parking spaces located at-grade near all the new buildings. On the ground floor, the short-term spaces are distributed directly across the main building entrances of Buildings 1, 2, and 3 while the pick-up / drop-off loop is located between Buildings 4 and 5. The facilities can support a total accumulation of 12 vehicles (i.e., approximately 1 pick-up / drop-off space for every 145 units), which is anticipated to accommodate the proposed residential and retail uses of the site.

Moreover, due to the site's evolving location within the City (i.e., Kingston Road corridor with bus and cycling facilities and future BRT service), it is anticipated that an increasing number of users will arrive to and from the site using alternative means of transportation.

The proposed pick-up / drop-off facilities are expected to serve as a convenient short-term parking strategy for day-to-day activities (i.e., pizza delivery, passenger pick-up / drop-off, ride-sharing services). As mentioned, while not formally required from a Zoning By-law perspective, it is anticipated that these will benefit future residents, visitors, and employees and meet the practical needs of the site while limiting vehicular impacts on the area road network.

Appendix D illustrates the supply and location of the proposed pick-up / drop-off facilities.

9.0 TRANSPORTATION DEMAND MANAGEMENT

9.1 Framework and Objectives

Based upon the Durham Region's Traffic Impact Study Guidelines and Draft Transportation Demand Management Guidelines for New Developments (2021), a Transportation Demand Management ("TDM") Plan is required to support the proposed development. The City of Pickering's Integrated Transportation Master Plan defines TDM as a set of policies, programs, services, and initiatives that aim to reduced single-occupant vehicles by influencing how or how much, when, where, and why people travel.

The City of Pickering outlines key TDM opportunities / objectives that the proposed development has considered in developing the TDM Plan, including improving transit and active mode access to the Pickering GO station.

In addition, the TDM Plan provides a mix of "hard" (infrastructure-based) and "soft" (program-based or operational) strategies, which are implemented once the use is constructed and occupied.

9.2 Proposed TDM Strategies

The TDM Plan has been developed with consideration to the following categories:

- Reduced car ownership and vehicle parking management;
- Encourage and facilitate transit use;
- Encourage and facilitate bicycle use;
- Enhance pedestrian access and walkability; and
- Land use within site context.

Table 18 summarizes the TDM strategies being considered based on the site's high density mixed-use development. It is noted that the strategies are to be further refined and discussed with the City and Region throughout the ZBA and SPA processes.

Table 18 Proposed On-site TDM Strategies

Category	Intent and Outcome	Responsibility	Estimated Timeline	Proposed TDM Strategy
Reduced Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Applicant	Construction of Development	1. Provide a reduced vehicle parking supply relative to the minimum as-of-right Zoning By-law requirements.
Reduce Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Applicant	Construction of Development	2. Provide on-site pick-up / drop-off facilities near each proposed building to support ride-sharing activities.
Reduce Car Ownership and Vehicle Parking Management	Reduce single-occupancy and / or privately-owned vehicle use for daily travel, particularly during peak periods.	Marketing / Sales	Construction of Development	3. Provide unbundled vehicle parking for each new residential unit.
Transit Use	Encourage increased transit use and provide access to transit infrastructure and facilities near the site.	Applicant	Construction of Development	4. Provide a transportation information package, including existing and planned transit services and schedules, for each new residential unit.
Transit Use	Encourage increased transit use and provide access to transit infrastructure and facilities near the site.	Applicant	Construction of Development	5. Provide enhanced active transportation connections to transit stops within and around the site.
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	6. Provide bicycle parking that exceeds the minimum as-of-right Zoning By-law requirements (i.e., also exceeds City of Pickering Draft Comprehensive Zoning By-law).
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	7. Provide 15% required long-term bicycle parking spaces with energized outlets.
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	8. Provide on-site bicycle repair stations.

Category	Intent and Outcome	Responsibility	Estimated Timeline	Proposed TDM Strategy
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Building Management	Building Occupancy	9. Provide opportunities for primary site users to attend events and participate in Smart Mobility Durham Programs (e.g., Smart Commute Durham, Cycle Durham, and Active and Sustainable School Travel Program).
Bicycle Use	Encourage increased bicycle use, provide operational cycling infrastructure and facilities on-site, enhance bicycle service on-site and within the external network.	Applicant	Construction of Development	10. Provide a transportation information package, including existing and planned cycling facilities and on-site amenities, for each new residential unit.
Pedestrian Access and Walkability	Enhance walkability to and from the site, create high quality and safe pedestrian linkages, increase access to key destinations and transit stops.	Applicant	Construction of Development	11. Provide continuous and widened sidewalk connections along Kingston Road and on-site.
Land Use within Site Context	Reduce length or frequency of travel and encourage internal site trips.	Applicant	Construction of Development	12. Provide a mixed-use transit-oriented development with various nearby and on-site services and amenities.

10.0 FUNCTIONAL ROAD PLAN

10.1 Kingston Road

As discussed in **Section 4.2.2**, Metrolinx is working with Region, DRT, City of Toronto, and the TTC to plan and design the future 36-kilometre DSBRT along the Kingston Road corridor, extending from Downtown Oshawa in the east to Scarborough Centre in the west.

The DSBRT was identified as the preferred transit technology to link Durham and Scarborough through Metrolinx's 2041 Regional Transportation Plan and the DSBRT Initial Business Case completed in January 2019. The DSBRT plans to include dedicated bus lanes, enhanced bus service, and smart signals along Kingston Road and greater connections to other transit modes.

The DSBRT was further assessed under the Transit Project Assessment Process through Ontario Regulation 231/08. In March 2022, the Minister of Environment, Conservation and Parks issued a Notice to Proceed with the transit project. The TPAP, in collaboration with Metrolinx and Durham Region, later issued a Statement of Completion.

To assist in the development of the functional road plan at the site, Metrolinx has provided a high-level 2D conceptual plan for the design of the DSBRT between Whites Road and Delta Boulevard, as an interim output from its ongoing process (i.e., TPAP approved 30% preliminary design in 2022). Refer to **Appendix F** for further details.

Appendix G provides the ultimate functional design condition of Kingston Road (i.e. 45-metre right-of-way) at the site. It is noted that the functional design plans provided as part of this study are conceptual at this stage and are prepared for discussion purposes with the City and Region.

10.2 North-South Public Road

As discussed in **Section 3.2**, the City of Pickering designates the existing north-south private road as a future public road as part of the Kingston Road Corridor and Specialty Retailing Node Intensification Plan (2019) and the Official Plan under OPA 38 Schedule 'B' – Whites Precinct Intensification Area (2022). According to these plans, the public road is proposed to have a future ROW of 19.0 to 21.0 metres and will extend from Kingston Road to the north and its southern terminus at a planned public park to the south.

It is proposed to maintain the existing pavement width of 17.35 metres. The proposed public road will extend directly south of Delta Boulevard, between Kingston Road in the north to its southern terminus as a cul-de-sac in the south, adjacent to the proposed on-site urban park.

Appendix G provides the proposed interim and ultimate (i.e., 27.35-metre ROW) functional design conditions of the new public road, as guided by the City of Pickering's UDG, and is further discussed below. It is noted that the functional design plans provided as part of this study are prepared for discussion purposes with the City.

10.2.1 Interim Roadway Condition

The interim design for the north-south public road assumes redevelopment of the west side of the road (i.e., full construction of the proposed development) and ties into the existing condition of the east side of the road (i.e., existing auto dealership development and access remains as-is). The interim design will be accommodated while maintaining the existing pavement width of 17.35 metres. The proposed cross section elements for the interim condition are as follows:

- 2.0 metre sidewalk (west side only);
- 1.0 metre landscape buffer (west side only);
- 2.0 metre cycle track (west side only);

- 4.2 metre travel lanes (one per direction);
- 3.7 metre dedicated left-turn lane at intersection with Kingston Road; and
- Approximate 4.8 metre through / right-turn lane at intersection with Kingston Road.

10.2.2 Ultimate Roadway Condition (27.35-metre ROW)

The ultimate design for the north-south public road assumes redevelopment of both sides of the road (i.e., full construction of the proposed development and redevelopment of the existing auto dealership). The ultimate design will be accommodated while maintaining the existing pavement width of 17.35 metres. The proposed cross section elements for the ultimate condition are as follows:

- 2.0 metre sidewalk (both sides);
- 1.0 metre landscape buffer (both sides);
- 2.0 metre cycle track (both sides);
- 4.2 metre travel lanes (one per direction);
- 3.7 metre dedicated left-turn lane at intersection with Kingston Road; and
- Approximate 4.8 metre through / right-turn lane at intersection with Kingston Road.

10.2.3 Site Access

As discussed in **Section 2.0**, two driveway accesses are proposed at the southern terminus (i.e., cul-de-sac) of the new north-south public road and will operate as all-moves, unsignalized (STOP-control) intersections. In addition, the site accesses are located approximately 75 metres south of the Kingston Road and north-south public road intersection (centreline-to-centreline distance) and will serve all site traffic activity. The proposed site accesses will be constructed upon completing the interim and ultimate conditions of the new north-south public road.

The design of the site accesses provides appropriate curb radii (i.e., minimum of 3 metres) to the cul-de-sac and driveway width (i.e., minimum of 6 metres).

Functional design drawings illustrating the proposed site access is provided in **Appendix G**.

10.2.4 Cul-de-sac

As mentioned, a cul-de-sac is proposed at the southern terminus of the north-south public road, which currently serves the site access.

In the ultimate condition of the north-south public road, the cul-de-sac provides a standard size (i.e., radius of 13 metres), with additional 2.0 metre sidewalks, based on City of Pickering Drawing P-711 (Typical Residential Cul-De-Sac), dated October 2019.

In the interim condition of the north-south public road, it is proposed to provide a reduced cul-de-sac (i.e., radius of 10 metres). The reduced cul-de-sac size is considered appropriate based on a review of manoeuvres for anticipated public servicing vehicles that can comfortably ingress and egress the proposed cul-de-sac area (i.e., snowplow, garbage truck, and fire truck).

Vehicle manoeuvring diagrams supporting the reduced cul-de-sac size in the interim condition is provided in **Appendix E**.

11.0 MULTIMODAL TRAVEL DEMAND FORECASTING

Given the location of the site along the planned Durham-Scarborough Bus Rapid Transit corridor, the site's residents and visitors are provided with reliable non-automobile travel alternatives. The target mode shares provided by the DSBRT Study, conducted by IBI Group in Spring of 2018, will be considered in the forecasting of multimodal trip generation in each horizon year. The continued evolution of selected travel modes to be less auto dependent in the Pickering area, and in the site vicinity, is in line with the City and Region's planning policies that were previously discussed in **Section 3.0**.

For the purposes of the travel demand forecasting discussion, references are made regarding four (4) types of trip-making throughout the following sections. The terminology for these trip types is described below.

- **Gross Person Trip** – refers to all person trips to / from the proposed development, inclusive of trips both internal (occurring within the site, namely by walking between the proposed residential and retail uses) and external to the site (attracting person trips to and from the site via origins and destinations that are outside the site lands).
- **Internal / Interaction Trip** – refers to trips made between the proposed land uses internal to the site (i.e., the residential and retail uses) and would use the internal site network exclusively as pedestrians (i.e., walking from one use to another).
- **Primary Retail Trip** – refers to retail trips that are directly generated by the proposed development where the other end of the trip is external to the site and not within the site vicinity.
- **Pass-by Retail Trip** – refers to pre-existing trips along the travel corridor, where both ends of the trip are external to the site yet are attracted to the site's proposed retail, making the visit while en-route their pre-existing trip.

A summary of the trip forecasting procedure is as follows (to be further discussed in the following sections):

1. Travel demand for the residential uses has been developed based on an assessment of gross person trips – i.e. the total number of *person* trips generated by the development, using surveyed trip rates established from person traffic count data at various proxy sites in a similar urban setting.
2. Travel demand for the ancillary retail uses has been conservatively developed based on the ITE Trip Generation Manual (11^{th} Edition) formulations for gross person trips in a strip retail plaza.
3. Following the establishment of gross person trips for both the residential and ancillary retail uses, the internal trip capture potential will be forecast based on the methodology published in Chapter 6 of the ITE Trip Generation Handbook (3^{rd} Edition) dated September 2017.
4. External trips can then be deduced by taking the remaining site trips that are not forecast as internal trips (i.e., "*gross trips – internal trips = external trips*"). Future target mode shares for each horizon year are then applied to the external person trips to obtain forecasts for each travel mode.

11.1 Gross Residential Site Travel Demand

The residential travel demand was forecast based on person trip surveys conducted at developments with similar travel contexts to the site. A summary of the collected trip generation data and the resulting trip rate is provided in **Table 19**.

Prior to the consideration of internal trip capture between the residential and retail uses, the residential uses of the site are expected to generate in the order of 785 gross person trips in the weekday peak hours.

Table 19 Residential Proxies and Gross Residential Site Travel Demand

Address ***Date of Survey***	**AM In**	**AM Out**	**AM Total**	**PM In**	**PM Out**	**PM Total**
1215-1235 Bayly Street (SF1&2), Pickering *Tuesday, March 28, 2023*	0.06	0.16	0.22	0.15	0.11	0.26
1215-1235 Bayly Street (SF1&2), Pickering *Wednesday, May 10, 2023*	0.06	0.19	0.25	0.19	0.10	0.29
1245-1255 Bayly Street (SF3), Pickering *Tuesday, March 28, 2023*	0.11	0.26	0.37	0.19	0.19	0.38
1245-1255 Bayly Street (SF3), Pickering *Wednesday, May 3, 2023*	0.08	0.22	0.30	0.22	0.15	0.37
200 Burnhamthorpe Road East, Mississauga *Thursday, November 29, 2022*	0.30	0.12	0.42	0.22	0.07	0.29
25 Fairview Road West, Mississauga *Wednesday, November 9, 2022*	0.16	0.40	0.56	0.35	0.12	0.47
2081 & 2087 & 2093 Fairview Street, Burlington *Tuesday, July 25, 2022*	0.06	0.25	0.31	0.27	0.19	0.46
Average	*0.12*	*0.23*	*0.35*	*0.23*	*0.13*	*0.36*
Selected Person Trip Rate	**0.10**	**0.35**	**0.45**	**0.25**	**0.20**	**0.45**
Gross Residential Trips (1,748 units)	**175**	**610**	**785**	**435**	**350**	**785**

Notes:
1. All trip rates are in trips per unit.
2. All proxy surveys were conducted on weekdays between Wednesday, November 9, 2022 and Wednesday, May 10, 2023.
3. All site trips are rounded to the nearest five (5).

11.2 Gross Retail Site Travel Demand

The ancillary retail travel demand was forecast by converting vehicle trip rates published in the ITE Trip Generation Manual (11^{th} Edition) under Land Use Code 822 (Strip Retail Plaza) to person trip rates. The trip rates pertaining to Land Use Code 822 were applied instead of 821 (Shopping Plaza) given that the retail uses are expected to act as ancillary to the residential uses on-site.

The vehicle trip data was converted to person trips based on the ITE's 95% mode share context for its proxies and average vehicle occupancy data of approximately 1.25[1]. Since the ITE trip rates are provided as trips per 1000 square feet of gross floor area (ft^2 GFA), the rates were converted to trips per 100 square metres (m^2) of GFA for ease of calculation. A summary of the ITE rates and resulting gross retail trips are provided in **Table 20**.

Prior to the consideration of internal trip capture, the ancillary retail uses of the site are expected to generate in the order of 100 and 285 gross person trips in the weekday morning and afternoon hours, respectively.

Table 20 ITE Retail Trip Rates and Gross Retail Site Travel Demand

	AM In	AM Out	AM Total	PM In	PM Out	PM Total
ITE Land Use Code 822 (Strip Retail Plaza) Fitted Curve – Person Trip Rates	1.51	0.99	2.50	3.64	3.65	7.29
Gross Retail Trips (3,922 m^2 GFA)	**60**	**40**	**100**	**140**	**145**	**285**

Notes:
1. All trip rates are in trips per 100 m^2 GFA.
2. All site trips are rounded to the nearest five (5).

[1] The mode share assumption of 95% is based on the documentation provided on page 38 of the ITE Trip Generation Handbook, 3^{rd} Edition (September 2017). The vehicle occupancy rate is based on the average of the vehicle occupancy data (values ranging from 1.05 to 1.46) provided in the same manual on pages 156-157.

11.3 Internal Trip Capture

The presence of multiple land uses (i.e., the residential and the ancillary retail uses) within the proposed site development supports the potential for internal trips between these uses. These trips are not considered to be external to the site, but rather, will be made primarily by walking between the uses within the proposed development. As a result, the total external trip generation is less than the sum of the trips that are generated by each discrete land use. The methodology for internal trip capture is described in detail in Chapter 6 of the ITE Trip Generation Handbook (3rd Edition).

These internal trips are removed from the trip generation potential of both the origin land use and the destination land use (i.e., from both “ends” of the “O-D” pairing). For example, one internal trip that originates from the residential component and ends in the retail component of the site is equivalent to one outbound internal trip for the residential component and one inbound internal trip for the retail component. If the residential component is forecasted to generate 10 total outbound trips in an hour, 1 of those outbound trips would be internal, while the remaining 9 outbound trips would be external. It can also be stated in an equation as:

Total Trip Generation Potential of Each Land Use = Internal Trips + External Trips

Consequently, external site trips for each specific land use are equal to the total site trips for each land use subtracted by the internal site trips. The external site trips represent the trips that would ultimately be experienced on the area transportation network. In order to estimate the number of internal trips to and from each land use to another, the methodology outlined in Chapter 6 of the ITE Trip Generation Handbook was adopted. Detailed calculations are presented in **Appendix H**. The resulting internal trips are summarized in **Table 21**.

Table 21 Internal Site Trip Capture

Destination	Origin	AM Peak Hour	PM Peak Hour
To Residential	From Retail	5	40
To Retail	From Residential	5	15
Total Internal Trips	--	**10**	**55**

A summary of the total, external, and internal site trips during the peak hours is provided in **Table 22**.

The site is expected to generate **885 and 1,070 two-way gross person trips** during the weekday morning and afternoon peak hours, respectively.

Of the total two-way trips, the site is expected to generate **20 and 110 internal trips** during the weekday morning and afternoon peak hours, respectively. These internal trips occur within the site development and do not cause any traffic-related impacts to the surrounding area road network.

The site is also expected to generate **865 and 960 external trips** during the weekday morning and afternoon peak hours, respectively. Of this total, 775 and 730 trips are external residential trips, while 90 and 230 trips are external retail trips.

Table 22 External and Internal Trip Generation Summary

Land Use	Trip Type	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Residential	Total	175	610	785	435	350	785
Residential	Internal	-5	-5	-10	-40	-15	-55
Residential	External	170	605	775	395	335	730
Retail	Total	60	40	100	140	145	285
Retail	Internal	-5	-5	-10	-15	-40	-55
Retail	External	55	35	90	125	105	230
Composite	**Total**	**235**	**650**	**885**	**575**	**495**	**1070**
Composite	**Internal**	**-10**	**-10**	**-20**	**-55**	**-55**	**-110**
Composite	**External**	**225**	**640**	**865**	**520**	**440**	**960**

Notes:

1. All site trips are rounded to the nearest five (5).

11.4 External Person Travel Demand

11.4.1 External Residential Multimodal Trips

Residential mode split data for the year 2016 was determined based on the Transportation of Tomorrow Survey (TTS). The 2016 data is the most recent set of TTS data that was available at the time of this study. The 2016 data demonstrates that a large proportion of home-based trips in the area rely on auto modes (78% during peak hours), with only 14% of all trips using transit.

IBI Group's *Final Report Durham-Scarborough Bus Rapid Transit Study* provided a future target transit mode share of 33% for the Downtown Pickering area with BRT along the centre median, which represents a 19% increase in transit mode share (or a 19% transit mode shift) relative to 2016 conditions. This 19% transit mode shift also results in the decrease in the auto mode shares (auto driver and auto passenger) by the same percentage.

Given that this report analyzes the 2029, 2034 and 2039 horizon years, the transit mode split increases and respective auto mode split decreases in each of the horizon years was interpolated based on the 2016 mode splits and the 2041 targets.

The 2016 TTS mode splits, the 2041 target mode splits, and the applied mode splits for each horizon year are all summarized in **Table 23**.

Table 23 Future Residential Mode Splits

Travel Mode	2016 Mode Splits[1]	2029 Applied Mode Splits[3]	2034 Applied Mode Splits[3]	2039 Applied Mode Splits[3]	DSBRT 2041 Mode Splits[2]
Auto Driver	62%	54%	51%	48%	47%
Auto Passenger	16%	14%	13%	12%	12%
Auto	**78%**	**68%**	**64%**	**60%**	**59%**
Transit	14%	24%	28%	32%	33%
Cycling	0%	1%	1%	1%	1%
Walking	8%	7%	7%	7%	7%
Non-Auto	**22%**	**32%**	**36%**	**40%**	**41%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:
1. Travel modes are based on home-based trips within TTS zones 1038, 1040, 1041 and 1048. The TTS data outputs are provided in Appendix I.
2. The target mode splits are obtained from the Durham-Scarborough BRT Study by IBI Group in Spring of 2018. The transit mode increase is assumed alongside an auto mode decrease (including both drivers and passengers).
3. The 2029, 2034 and 2039 applied mode splits are used to forecast multimodal travel demand in each of the respective horizon years.

Residential multimodal trip forecasts are then calculated based on the external person trip generation and the future residential area mode splits. These forecasts are provided in **Table 24** (2029 horizon), **Table 25** (2034 horizon) and **Table 26** (2039 horizon).

The residential uses of the site are expected to generate in the order of 775 and 730 two-way external person trips in the weekday morning and afternoon peak hours, respectively.

In the 2029 horizon year, the residential uses will generate 415 and 390 auto driver trips in the peak hours, and 185 and 175 transit trips in the peak hours.

In the 2034 horizon year, the residential uses will generate 395 and 370 auto driver trips in the peak hours, and 225 and 200 transit trips in the peak hours.

In the 2039 horizon year, the residential uses will generate 370 and 350 auto driver trips in the peak hours, and 250 and 230 transit trips in the peak hours.

Table 24 Multimodal Residential Site Trips (2029 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**170**	**605**	**775**	**395**	**335**	**730**
Auto Driver	90	325	415	210	180	390
Auto Passenger	25	85	110	55	45	100
Transit	40	145	185	95	80	175
Cycle	5	10	15	5	5	10
Walk	10	40	50	30	25	55

Notes:
1. All site trips are rounded to the nearest five (5).

Table 25 Multimodal Residential Site Trips (2034 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**170**	**605**	**775**	**395**	**335**	**730**
Auto Driver	85	310	395	200	170	370
Auto Passenger	20	80	100	50	45	95
Transit	55	170	225	110	90	200
Cycle	0	5	5	5	5	10
Walk	10	40	50	30	25	55

Notes:
1. All site trips are rounded to the nearest five (5).

Table 26 Multimodal Residential Site Trips (2039 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**170**	**605**	**775**	**395**	**335**	**730**
Auto Driver	80	290	370	190	160	350
Auto Passenger	20	75	95	45	40	85
Transit	55	195	250	125	105	230
Cycle	5	5	10	5	5	10
Walk	10	40	50	30	25	55

Notes:
1. All site trips are rounded to the nearest five (5).

11.4.2 External Retail Multimodal Trips

Retail mode split data for the year 2016 was also determined based on the Transportation of Tomorrow Survey (TTS). The 2016 data demonstrates that a large proportion of market-based trips in the area rely on auto modes (95% during peak hours), with only 4% of all trips using transit.

Similar to the future residential mode splits, a shift in both the transit and auto travel mode splits can be expected with the presence of the BRT. A total transit mode shift of 8% was assumed for retail uses, in addition to the increase in other actie transportation modes of travel.

Given that this report analyzes the 2029, 2034 and 2039 horizon years, the transit mode split increases and respective auto mode split decreases in each of the horizon years was interpolated based on the 2016 mode splits and the 2041 targets.

The 2016 TTS mode splits, the 2041 target mode splits, and the applied mode splits for each horizon year are all summarized in **Table 27**.

Table 27 Future Retail Mode Splits

Travel Mode	2016 Mode Splits[1]	2029 Applied Mode Splits[3]	2034 Applied Mode Splits[3]	2039 Applied Mode Splits[3]	DSBRT 2041 Mode Splits[2]
Auto Driver	77%	74%	72%	69%	68%
Auto Passenger	18%	18%	17%	16%	16%
Auto	**95%**	**92%**	**89%**	**85%**	**84%**
Transit	4%	4%	7%	11%	12%
Cycling	0%	1%	1%	1%	1%
Walking	1%	3%	3%	3%	3%
Non-Auto	**5%**	**8%**	**11%**	**15%**	**16%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:
1. Travel modes are based on market-based trips within TTS zones 1041, 1042, 1046, 1047, 1048 and 1049. The TTS data outputs are provided in Appendix I.
2. The target mode splits are assumed based on an approximate 10% transit mode increase (and a concurrent 10% auto mode decrease that is divided into auto drivers and auto passengers).
3. The 2029, 2034 and 2039 applied mode splits are used to forecast multimodal travel demand in each of the respective horizon years.

Retail multimodal trip forecasts are then calculated based on the external person trip generation and the future retail area mode splits. These forecasts are provided in **Table 28** (2029 horizon), **Table 29** (2034 horizon) and **Table 30** (2039 horizon).

The retail uses of the site are expected to generate in the order of 90 and 230 two-way external person trips in the weekday morning and afternoon peak hours, respectively.

In the 2029 horizon year, the retail uses will generate 65 and 165 auto driver trips in the peak hours, and 10 transit trips in the peak hours.

In the 2034 horizon year, the retail uses will generate 65 and 165 auto driver trips in the peak hours, and 10 and 15 transit trips in the peak hours.

In the 2039 horizon year, the retail uses will generate 65 and 155 auto driver trips in the peak hours, and 10 and 30 transit trips in the peak hours.

Table 28 Multimodal Retail Site Trips (2029 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**55**	**35**	**90**	**125**	**105**	**230**
Auto Driver	40	25	65	90	75	165
Auto Passenger	10	5	15	25	20	45
Transit	5	5	10	5	5	10
Cycle	0	0	0	0	0	0
Walk	0	0	0	5	5	10

Notes:
1. All site trips are rounded to the nearest five (5).

Table 29 Multimodal Retail Site Trips (2034 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**55**	**35**	**90**	**125**	**105**	**230**
Auto Driver	40	25	65	90	75	165
Auto Passenger	10	5	15	20	20	40
Transit	5	5	10	10	5	15
Cycle	0	0	0	0	0	0
Walk	0	0	0	5	5	10

Notes:
1. All site trips are rounded to the nearest five (5).

Table 30 Multimodal Retail Site Trips (2039 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**55**	**35**	**90**	**125**	**105**	**230**
Auto Driver	40	25	65	85	70	155
Auto Passenger	10	5	15	20	15	35
Transit	5	5	10	15	15	30
Cycle	0	0	0	0	0	0
Walk	0	0	0	5	5	10

Notes:
1. All site trips are rounded to the nearest five (5).

11.4.3 Total External Multimodal Trips

Based on the multimodal trips forecast in **Sections 11.4.1** and **11.4.2**, the site's total multimodal trips are summarized in **Table 31** (2029 horizon), **Table 32** (2034 horizon) and **Table 33** (2039 horizon).

The site is expected to generate in the order of 865 and 960 two-way external person trips in the weekday morning and afternoon peak hours, respectively. As outlined in the DSBRT Study, as the area transportation context continues to evolve and residents and visitors are provided with viable travel alternatives (i.e., becoming less auto-oriented than under current conditions), the auto driver trips to and from the site is expected to shift towards more transit usage.

In the 2029 horizon year, the site will generate 480 and 555 auto driver trips in the peak hours, and 195 and 185 transit trips in the peak hours.

In the 2034 horizon year, the site will generate 460 and 535 auto driver trips in the peak hours, and 235 and 215 transit trips in the peak hours.

In the 2039 horizon year, the site will generate 435 and 505 auto driver trips in the peak hours, and 260 transit trips in the peak hours.

The vehicle trips summarized above will be analyzed on the study area road network in **Section 13.0** for each respective horizon year.

Table 31 Total Multimodal Site Trips (2029 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**225**	**640**	**865**	**520**	**440**	**960**
Auto Driver	130	350	480	300	255	555
Auto Passenger	35	90	125	80	65	145
Transit	45	150	195	100	85	185
Cycle	5	10	15	5	5	10
Walk	10	40	50	35	30	65

Notes:
1. All site trips are rounded to the nearest five (5).

Table 32 Total Multimodal Site Trips (2034 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**225**	**640**	**865**	**520**	**440**	**960**
Auto Driver	125	335	460	290	245	535
Auto Passenger	30	85	115	70	65	135
Transit	60	175	235	120	95	215
Cycle	0	5	5	5	5	10
Walk	10	40	50	35	30	65

Notes:
1. All site trips are rounded to the nearest five (5).

Table 33 Total Multimodal Site Trips (2039 Horizon Year)

Travel Mode	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Person Site Trips	**225**	**640**	**865**	**520**	**440**	**960**
Auto Driver	120	315	435	275	230	505
Auto Passenger	30	80	110	65	55	120
Transit	60	200	260	140	120	260
Cycle	5	5	10	5	5	10
Walk	10	40	50	35	30	65

Notes:
1. All site trips are rounded to the nearest five (5).

12.0 TRAFFIC VOLUME FORECASTING

12.1 Baseline Existing Traffic Volumes

Turning movement counts (TMC) were conducted by Spectrum Traffic Inc. on behalf of BA Group for the study area intersections in May of 2024. The counts were completed during the weekday morning and afternoon peak periods (the busiest hours of traffic on weekdays are generally between 7:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.).

The list of study area intersections and respective data collection information is provided in **Table 34**. All collected turning movement count data is provided in **Appendix J**.

Table 34 Data Collection Information

Intersection	Date of Count	Source
Kingston Road / Whites Road	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / Delta Boulevard	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / 715 & 775 Kingston Driveway / 780 Kingston Driveway	Tuesday, May 14, 2024	Spectrum Traffic Data
Kingston Road / Highway 401 Ramps	Tuesday, May 14, 2024	Spectrum Traffic Data
Whites Road / Highway 401 Ramps	Tuesday, May 14, 2024	Spectrum Traffic Data
Delta Boulevard / Existing Site Access / 715 & 775 Kingston Driveway	Tuesday, May 14, 2024	Spectrum Traffic Data

Existing turning movement volumes were rounded to the nearest five (5) vehicles and reviewed in detail to ensure a general consistency in the traffic volumes on links between intersections. The resultant baseline existing traffic volumes for the weekday morning and afternoon peak hours adopted for the purposes of this analysis are illustrated in **Figure 13**.

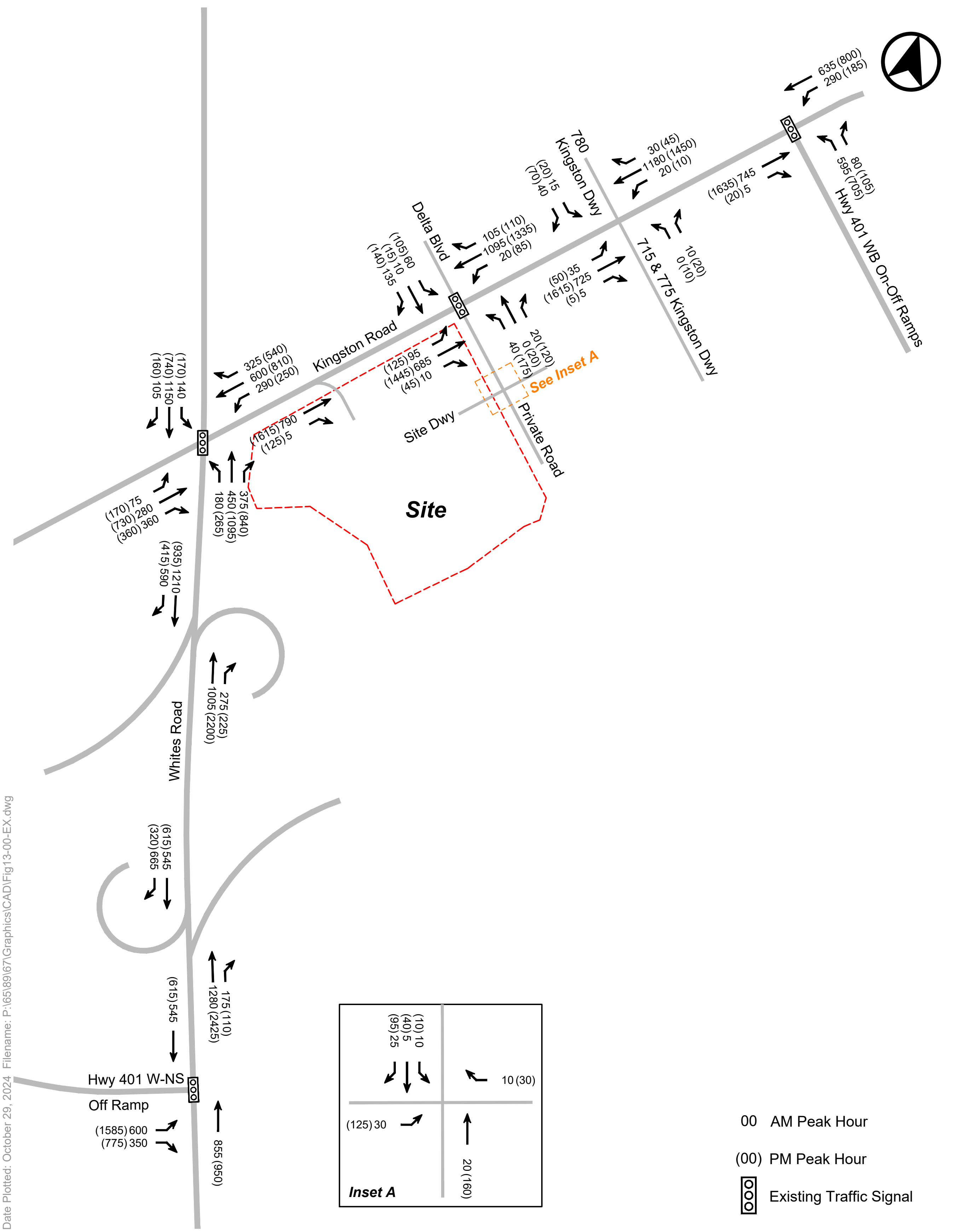

FIGURE 13 BASELINE EXISTING TRAFFIC VOLUMES

12.2 Future Background Traffic Volumes

12.2.1 Analysis Horizons

Based on discussions with the City of Pickering, Region of Durham and Ministry of Transportation Ontario, the analysis horizons presented in this report include the 2029 year (buildout year that is 5 years from today) and 2034 year (10 years from today) for all study area intersections. Based on the MTO's Traffic Impact Study Guidelines, analysis will be provided for the Highway 401 ramps up to the 2039 year (15 years from today).

12.2.2 Background Developments

Allowances were made to account for new traffic generated by other development proposals in the area that are either under construction, approved, being reviewed or for which an application is expected to be submitted to the City of Pickering within the horizons of 2029, 2034 and 2039. Developments that are expected to be built out beyond the site buildout year of 2029 are not included in the analysis.

A total of 13 development proposals are expected to be built out, including almost 23,000 residential units and 50,000 m^2 non-residential GFA. Background developments included in the analysis are summarized in **Table 35.**

Trip generation rates and traffic assignments adopted for each background development are based on information contained in the traffic impact studies (TIS) prepared for each project.

Table 35 Area Background Developments

Development	Development Statistics	Trip Generation Source
1101A, 1105 and 1163 Kingston Road	**Phase 1: By 2028** 1,211 residential units 4,946 m^2 retail GFA **Full Buildout: By 2033** 5,238 residential units 7,150 m^2 retail GFA	WSP Traffic Study (October 2023)
875 Kingston Road	337 residential units 630 m^2 retail GFA	TYLin Traffic Study (September 2022)
720 Granite Court	261 residential units	GHD Traffic Study (April 2023)
1525 Pickering Parkway	538 residential units	WSP Traffic Study (October 2023)
1066 Dunbarton Road	41 residential units 100 m^2 commercial GFA	BA Traffic Study (December 2022)
1755 Pickering Parkway	**Phase 1: By 2026** 630 residential units 1,669 m^2 commercial GFA **Phases 2 to 4: By 2031** 2,558 residential units 2,622 m^2 commercial GFA **Phases 5 to 7: By 2036** 2,062 residential units 22,402 m^2 commercial GFA	RVA Traffic Study (April 2024)
375 Kingston Road	580 residential units 1,532 m^2 retail GFA	Crozier Traffic Study (December 2021)

Development	Development Statistics	Trip Generation Source
603-643, 645 and 699 Kingston Road	3,460 residential units 2,474 m^2 retail GFA 3,475 m^2 office GFA	BA Traffic Study (October 2023)
1854 & 1858 Liverpool Road	98 residential units 435 m^2 retail GFA	Trans-Plan Traffic Study (August 2019)
755 Oklahoma Drive	27 residential units	Nextrans Traffic Study (July 2020)
1294 Kingston Road, 1848 & 1852 Liverpool Road	495 residential units 1,332 m^2 retail GFA	LEA Traffic Study (July 2020)
Pickering Town Centre	**Phase 1 Block 1: By 2029** 2,191 residential units 1,013 m^2 retail GFA **Full Phase 1: By 2034** 5,100 residential units 3,148 m^2 retail GFA	BA Traffic Studies dated April 2023 (Block 1) and July 2022 (Full Phase 1)
1095 Kingston Road	1,400 residential units 1,350 m^2 retail GFA	Forecasted based on trip generation and distribution parameters analogous to those presented in this study.

12.2.3 General Corridor Growth

Given the extensive list of background developments, the increasing capacity constraints in the study area and the implementation of the Kingston Road BRT by the year 2025, no further "general" corridor growth allowances are made along the major corridors of Kingston Road and Whites Road or at the Highway 401 ramp terminals.

It is expected that as study area intersections approach capacity, the composition of traffic on the road may change, evolving over time to serve more local traffic (including traffic to / from the subject site) rather than pass-through or longer-distance traffic that may be able to use alternate routes.

To further illustrate the impacts of the background development traffic allowances on the study area road network, the volumes resulting from the respective traffic studies are converted into annual growth rates along the Kingston Road and Whites Road corridors and the Highway 401 ramp terminals. These resultant growth rates are summarized in **Table 36**.

Table 36 Background Development Volumes as Resultant Corridor Growth Rates

Horizon / Corridor	Travel Direction	Growth Rates AM Peak Hour	Growth Rates PM Peak Hour
2029 / Kingston Road	Eastbound	2.41% to 6.85%	1.17% to 4.85%
2029 / Kingston Road	Westbound	0.00% to 3.00%	1.01% to 3.31%
2034 / Kingston Road	Eastbound	1.66% to 3.65%	0.68% to 2.18%
2034 / Kingston Road	Westbound	1.94% to 3.24%	1.11% to 2.00%
2029 / Whites Road	Northbound	0.44% to 2.02%	0.09% to 2.41%
2029 / Whites Road	Southbound	0.00% to 4.67%	0.27% to 3.68%
2034 / Whites Road	Northbound	0.22% to 1.22%	0.05% to 1.29%
2034 / Whites Road	Southbound	0.00% to 2.47%	0.13% to 2.31%
2029 / Highway 401 Ramps	On and Off-Ramps	0.52% to 2.56%	0.29% to 2.23%
2034 / Highway 401 Ramps	On and Off-Ramps	0.44% to 1.38%	0.37% to 2.13%
2039 / Highway 401 Ramps	On and Off-Ramps	0.29% to 0.92%	0.25% to 1.41%

The additional background development volumes considered on the study area road network would represent a substantial amount of corridor growth even to the 2039 horizon year if considered relative to baseline existing traffic volumes. Based on the foregoing, no further corridor growth was added.

12.2.4 Future Mode Shift to Bus Rapid Transit

As per IBI Group's *Final Report Durham-Scarborough Bus Rapid Transit Study* dated the Spring of 2018, the presence of the Kingston Road BRT is expected to encourage a travel mode shift towards transit in future conditions, especially as area development progresses and the Kingston Road arterial continues to approach capacity.

According to the Transportation Tomorrow Survey Data previously summarized in **Table 23** in Section **11.4.1**, the transit mode share in the site vicinity in 2016 was in the order of 14%. In the DSBRT Study, the target mode share for areas with a centre median BRT in Downtown Pickering was estimated to be approximately 33% by the year 2041 (an increase of 19% in transit travel between the 2016 data and the 2041 targets). For the purposes of all future conditions analysis, recognizing the increasing attractiveness of the transit travel mode as the area continues to develop, existing Kingston Road corridor volumes are reduced by 10% in each horizon year. Other background growth traffic volumes were not further adjusted given that a majority of the traffic studies already incorporate a similar reduction in their respective trip generation forecasts.

12.2.5 Background Growth Traffic Redistribution

Other potential changes to pre-existing network volumes and background development traffic assignments in the study area have been considered based upon:

- Changes to intersection configurations along the Kingston Road corridor to accommodate the BRT, including the prohibition of turns onto Kingston Road at unsignalized intersections as a result of the BRT median. This also includes the addition of U-turns at proximate signalized intersections to compensate for the loss of left turns.
- Signal timings have also been revised to include fully protected left turns instead of protected and permitted left turns. North-south pedestrian crossing times (including “walk” and “flash-don’t-walk” times) have also been increased where the width of the intersection has increased.
- Existing capacity constraints at the Kingston Road / Whites Road intersection especially in the weekday afternoon peak hour, resulting in vehicle trips diverting away from the Whites Road / Highway 401 Ramps to continue westward along Kingston Road.

12.2.6 Total Background Growth

The total background growth traffic volumes (inclusive of the background development traffic volumes, the transit shift reduction, and other redistributed traffic volumes) for the 2029, 2034 and 2039 horizon years are illustrated in **Figure 14**, **Figure 15** and **Figure 16**, respectively.

Future background traffic volumes (consisting of the established baseline existing traffic volumes and background growth traffic volumes) for the 2029, 2034 and 2039 horizon years are illustrated in **Figure 17**, **Figure 18** and **Figure 19**, respectively.

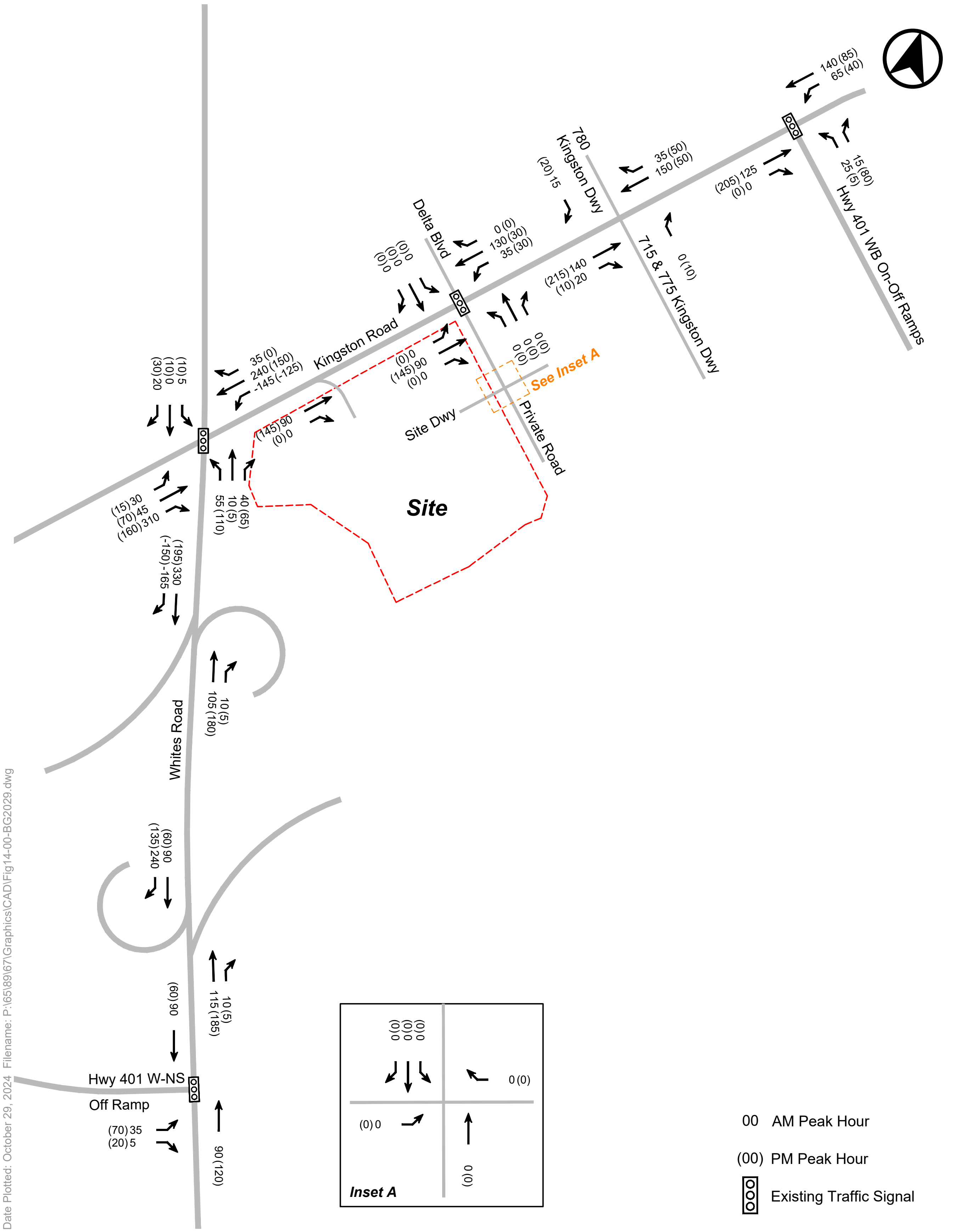

FIGURE 14 BACKGROUND GROWTH TRAFFIC VOLUMES (2029 HORIZON YEAR)

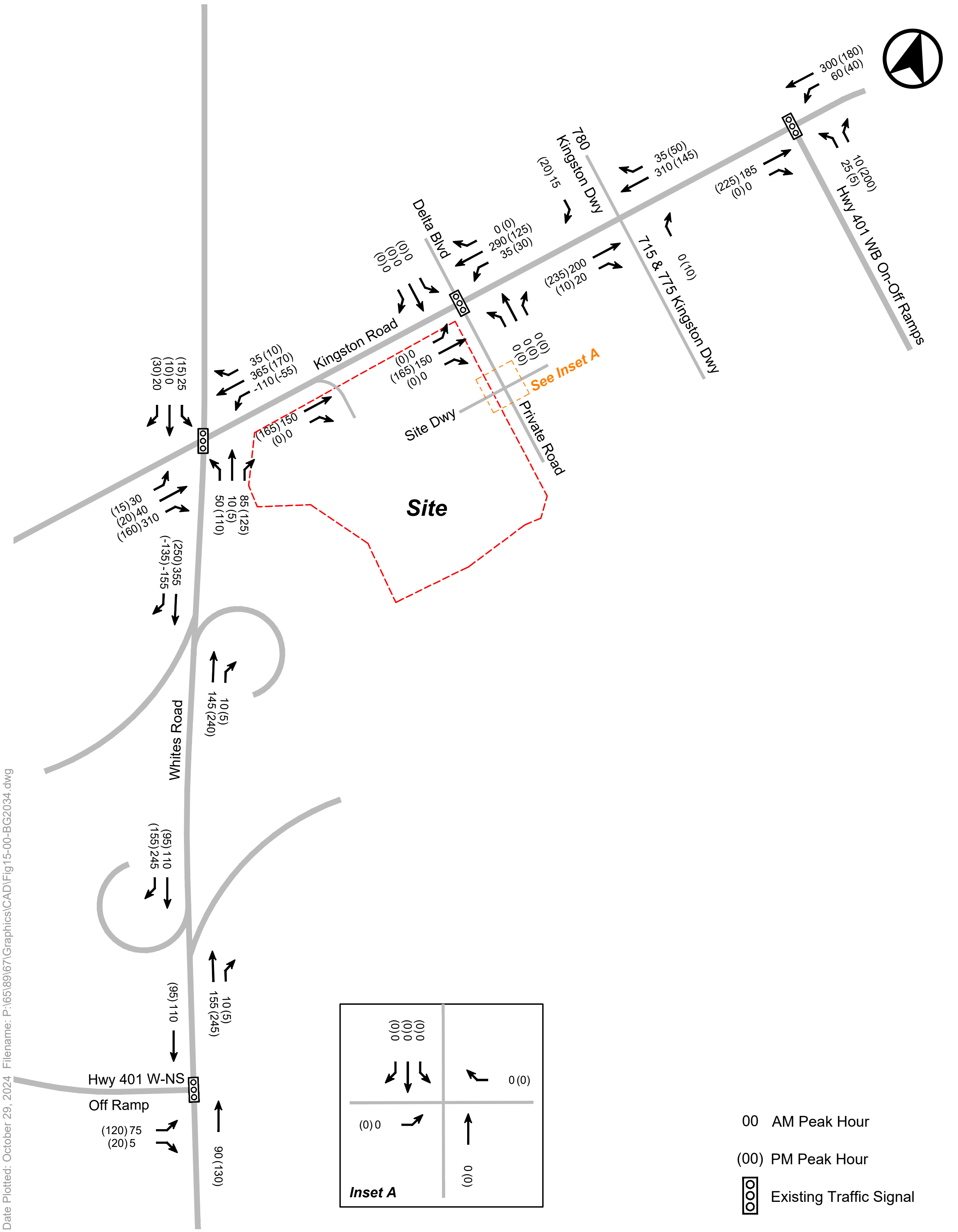

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FIGURE 15 BACKGROUND GROWTH TRAFFIC VOLUMES (2034 HORIZON YEAR)

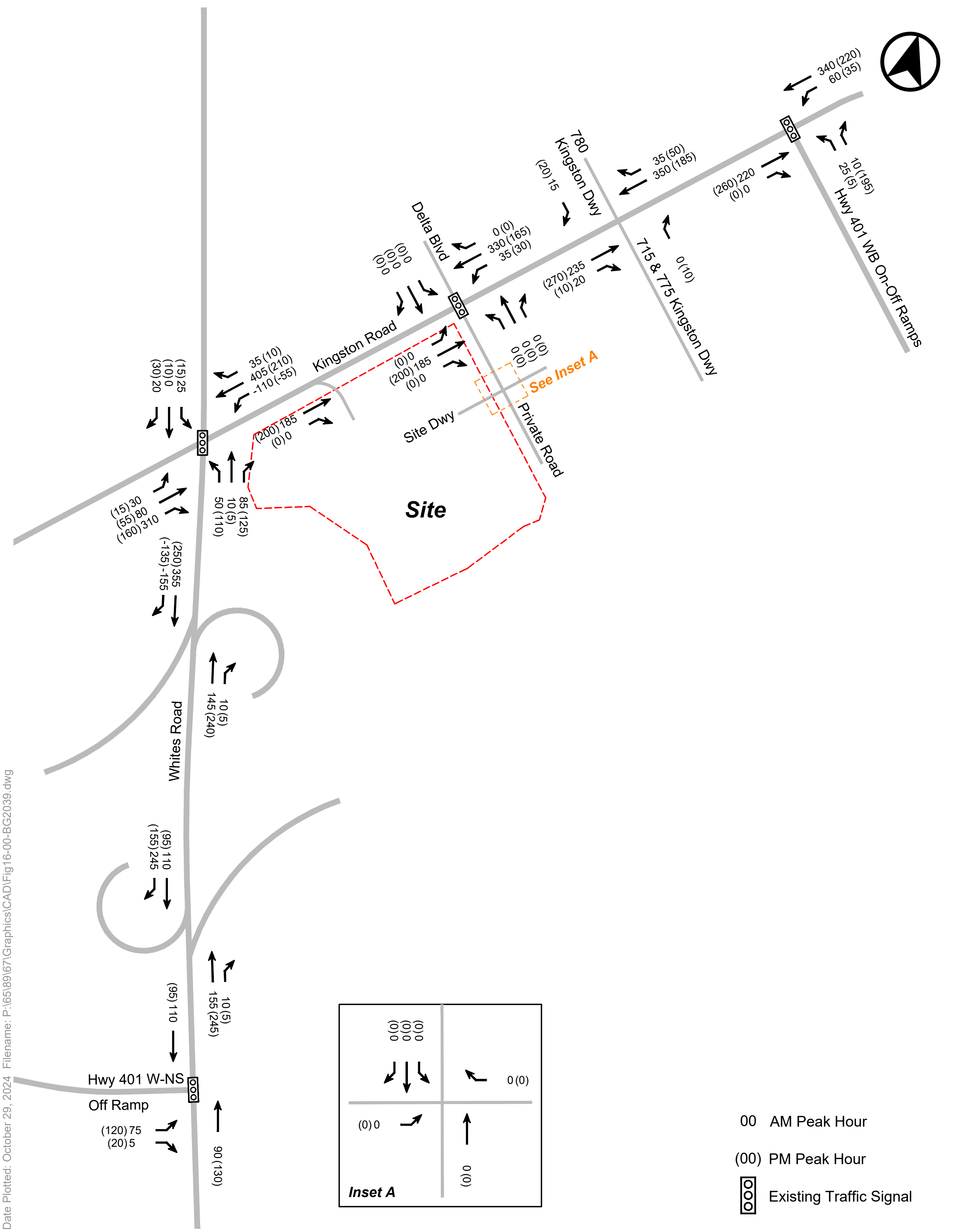

FIGURE 16 BACKGROUND GROWTH TRAFFIC VOLUMES (2039 HORIZON YEAR)

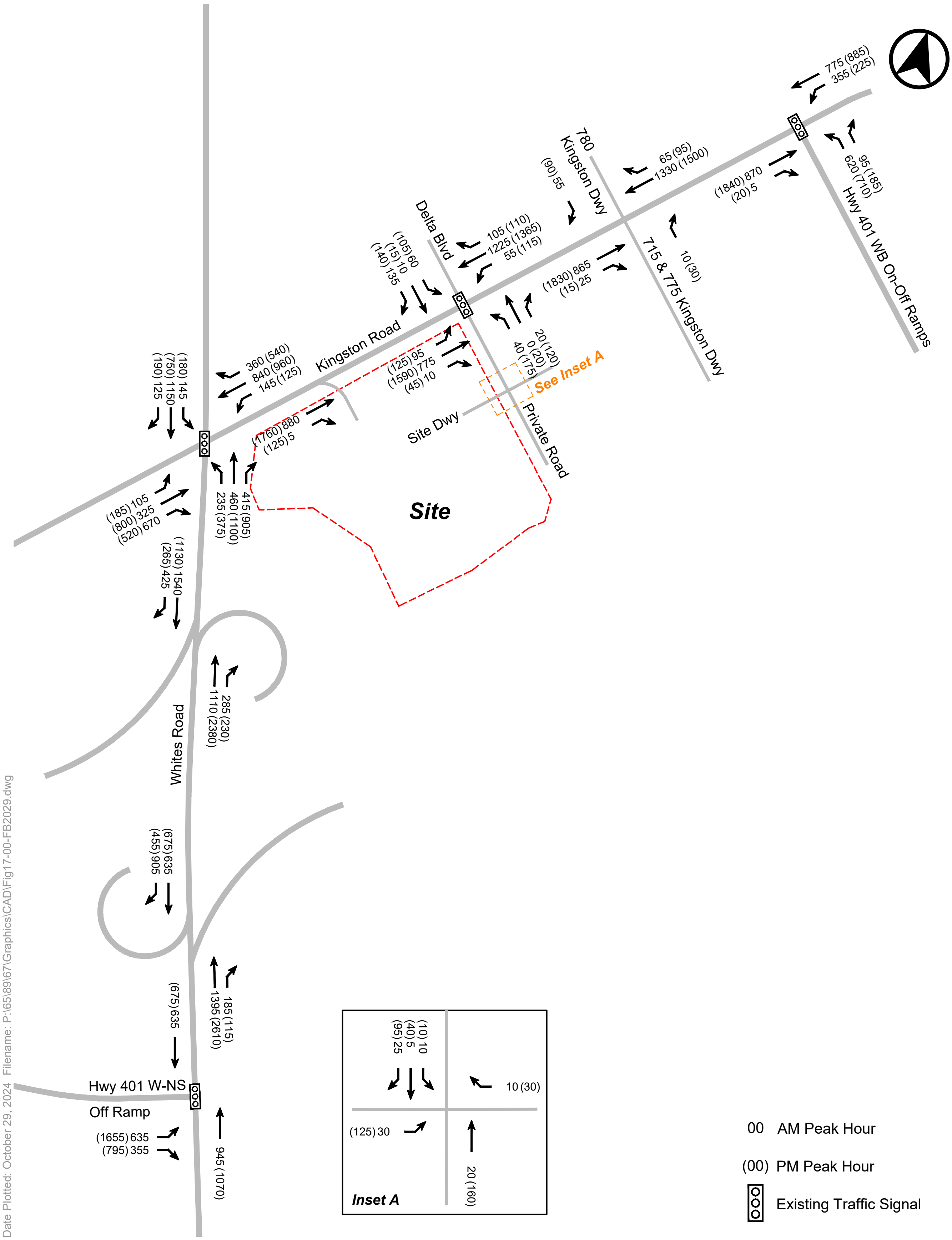

FIGURE 17 FUTURE BACKGROUND TRAFFIC VOLUMES (2029 HORIZON YEAR)

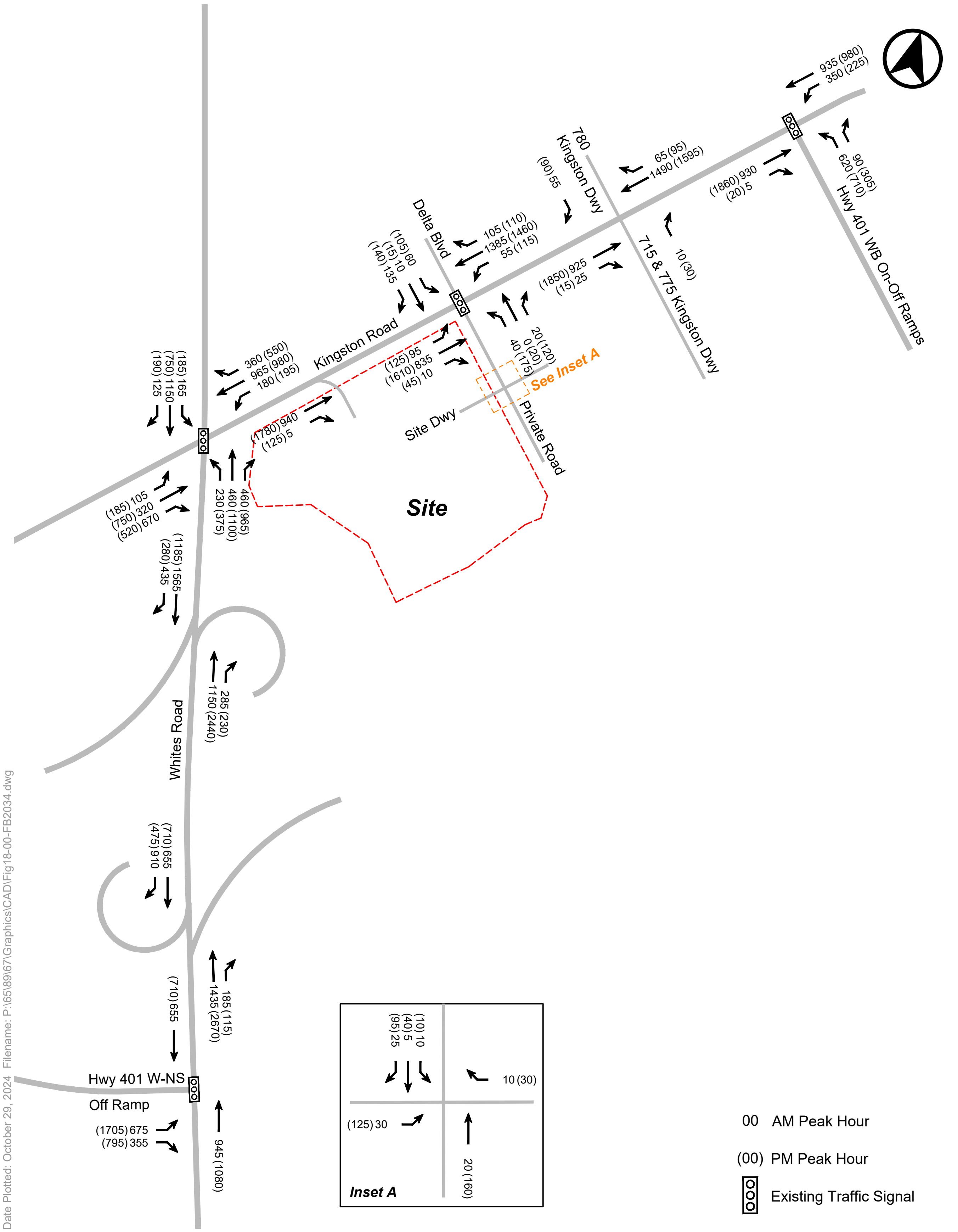

FIGURE 18 FUTURE BACKGROUND TRAFFIC VOLUMES (2034 HORIZON YEAR)

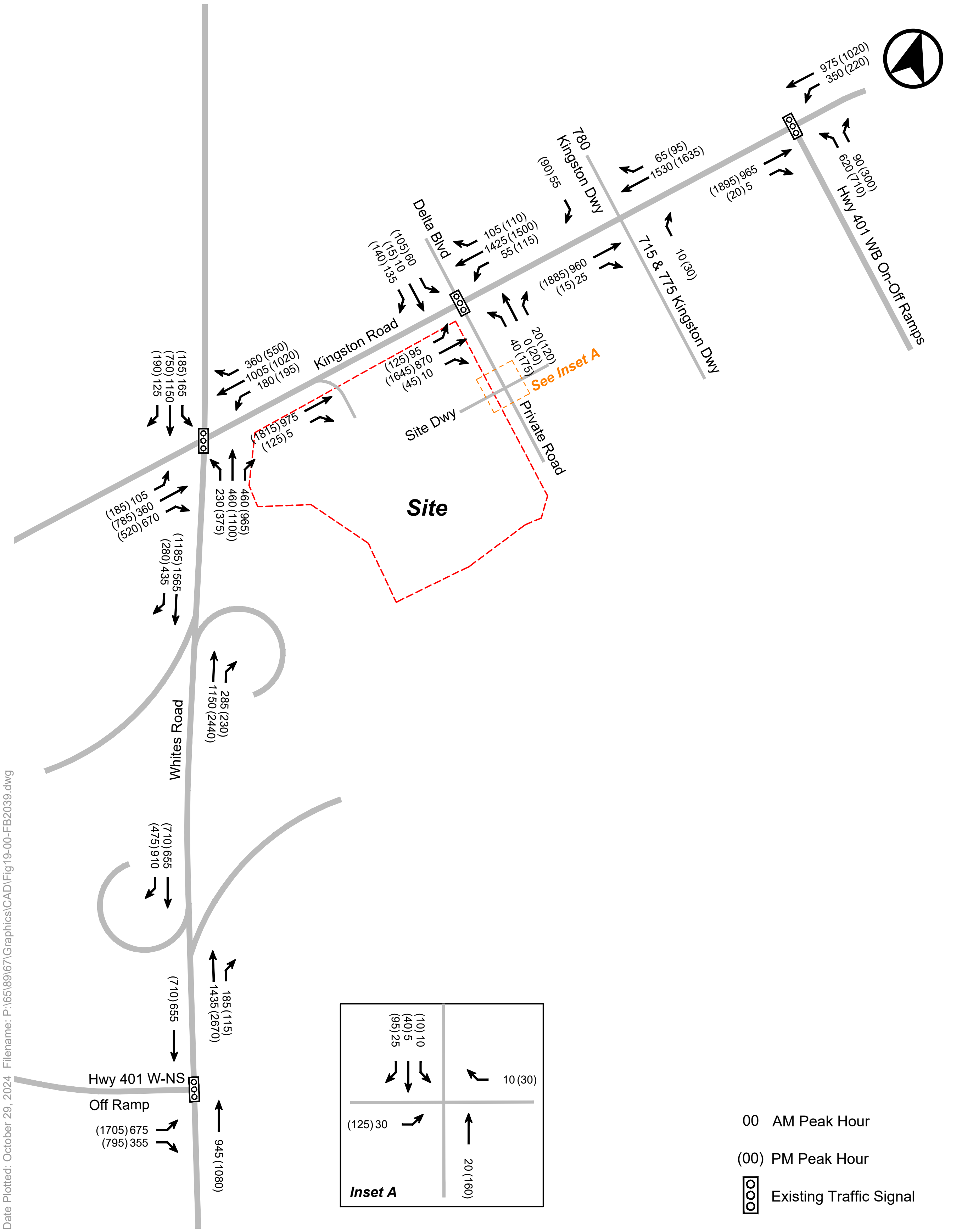

FIGURE 19 FUTURE BACKGROUND TRAFFIC VOLUMES (2039 HORIZON YEAR)

12.3 Site Traffic Volumes

12.3.1 Existing Site Trip Generation

The site is currently occupied by various commercial uses and surface parking. Based on the vehicle traffic observed at the site driveway in May of 2024, the site's current vehicular trip generation during the weekday morning and afternoon peak hours is summarized in **Table 37**.

The existing site generates approximately 55 and 220 two-way vehicle trips in the weekday morning and afternoon peak hours, respectively. With the redevelopment, the existing site traffic volumes will be removed from the study area road network (illustrated in **Figure 20**) and replaced with the future site traffic volumes.

Table 37 Existing Site Vehicle Trip Generation

	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips	25	30	55	95	125	220
Pass-by Trips	0	0	0	35	35	70
Primary Trips	25	30	55	60	90	150

Notes:

1. All existing site trips are rounded to the nearest five (5). The volumes are derived from the May 2024 set of turning movement counts.
2. Existing pass-by trips are estimated from the pass-by percentages provided in the ITE Trip Generation Handbook (3rd Edition) for LUC 820 Shopping Centre (0% in the weekday morning peak hour and 34% in the weekday afternoon peak hour).

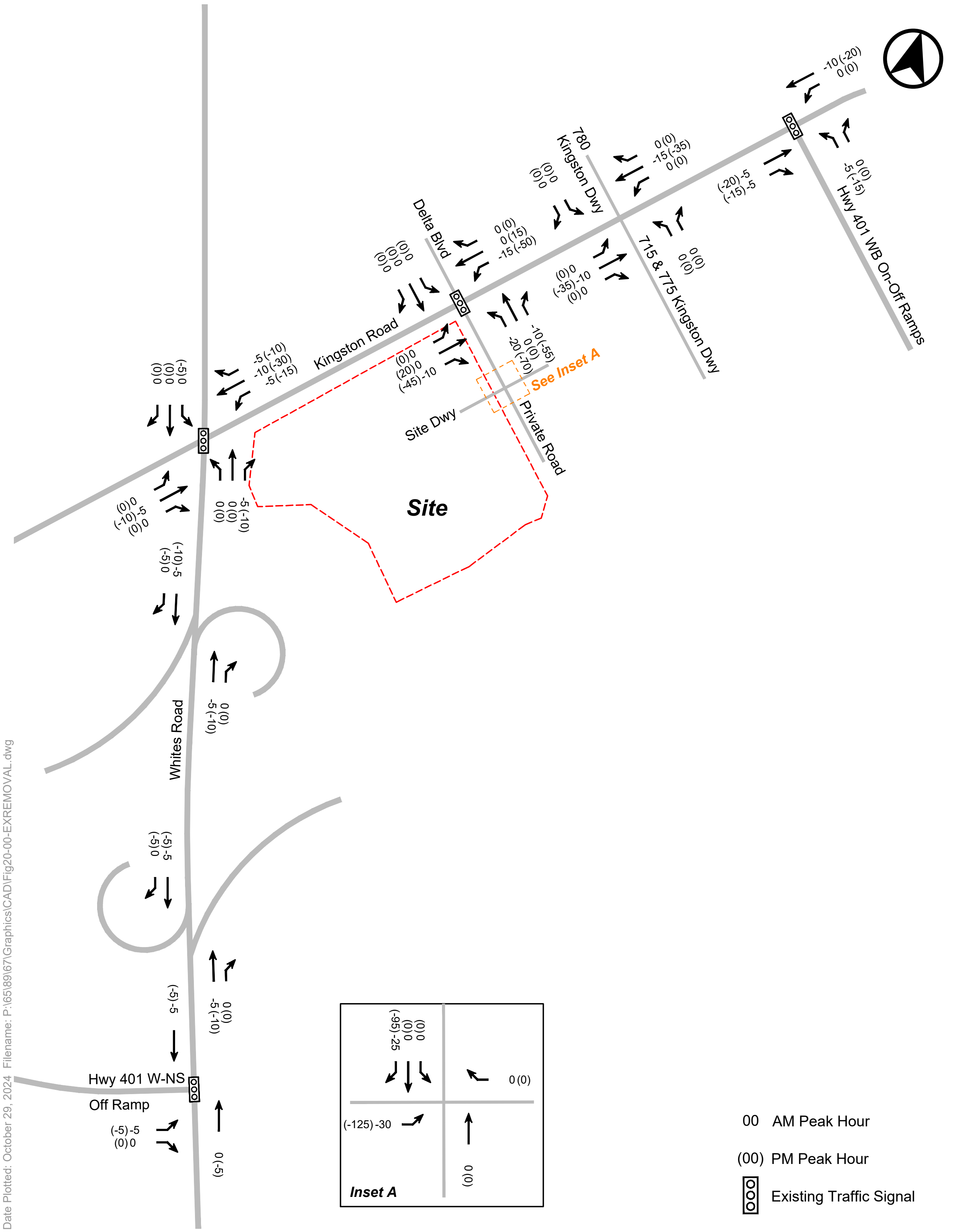

FIGURE 20 EXISTING SITE TRAFFIC VOLUMES (TO BE REMOVED)

12.3.2 New Site Trip Generation

The derivation of the site's vehicle trip generation was previously discussed in Section **11.4**, and summarized in **Table 38** (2029 horizon), **Table 39** (2034 horizon) and **Table 40** (2039 horizon). Pass-by trips were also calculated for the site's ancillary retail uses by assuming 10% pass-by in the weekday morning peak hour and following the ITE Trip Generation Handbook's weekday afternoon rate of 40% for LUC 821.

In the 2029 horizon year, the site will generate 480 and 555 auto driver trips in the peak hours. In the 2034 horizon year, the site will generate 460 and 535 auto driver trips in the peak hours. In the 2039 horizon year, the site will generate 435 and 505 auto driver trips in the peak hours. The declining site trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year. The vehicle trips summarized above will be analyzed on the study area road network in **Section 13.0** for each respective horizon year.

Table 38 Total Vehicle Site Trip Generation (2029 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Residential	90	325	415	210	180	390
Ancillary Retail	40	25	65	90	75	165
Pass-by Trips	5	5	10	35	35	70
Primary Trips	35	20	55	55	40	95
Total	**130**	**350**	**480**	**300**	**255**	**555**

Notes:
1. All site trips are rounded to the nearest five (5).

Table 39 Total Vehicle Site Trip Generation (2034 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Residential	85	310	395	200	170	370
Retail	40	25	65	90	75	165
Pass-by Trips	5	5	10	35	35	70
Primary Trips	35	20	55	55	40	95
Total	**125**	**335**	**460**	**290**	**245**	**535**

Notes:
1. All site trips are rounded to the nearest five (5).

Table 40 Total Vehicle Site Trip Generation (2039 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Residential	80	290	370	190	160	350
Retail	40	25	65	85	70	155
Pass-by Trips	5	5	10	30	30	60
Primary Trips	35	20	55	55	40	95
Total	**120**	**315**	**435**	**275**	**230**	**505**

Notes:
1. All site trips are rounded to the nearest five (5).

12.3.3 New Site Trip Assignment

Residential vehicle site trips were assigned onto the area road network based upon a review of travel information provided by the Transportation Tomorrow Survey (TTS) for home-based trips in the site environs. The TTS queries are provided in **Appendix I**. The residential site traffic distribution is summarized in **Table 41**. The residential site traffic volumes for the 2029, 2034 and 2039 horizon years are illustrated in **Figure 21**, **Figure 22** and **Figure 23**, respectively.

Retail vehicle site trips were assigned onto the area road network based upon a review of existing travel proportions and turning movements observed at the study area intersections. The retail site traffic volumes for the 2029, 2034 and 2039 horizon years are illustrated in **Figure 24**, **Figure 25** and **Figure 26**, respectively.

Table 41 Residential Site Traffic Distribution

To / From Cardinal Direction	Corridor	Inbound	Outbound
North	Whites Road North	15%	15%
North	Fairport Road	5%	5%
North	Dixie Road	10%	10%
North	Liverpool Road	5%	5%
South	Whites Road North	0%	0%
South	Liverpool Road	5%	5%
East	Kingston Road	10%	10%
East	Highway 401	10%	10%
West	Kingston Road	10%	10%
West	Highway 401	30%	30%
Total	--	**100%**	**100%**

Notes:
1. 2006 TTS zones include 1038 and 1040.

12.3.4 Net New Site Trip Generation

For comparison purposes, in the 2029 horizon, the site will generate 425 and 405 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2034 horizon, the site will generate 405 and 385 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2039 horizon, the site will generate 380 and 355 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions.

As previously mentioned, the declining net new trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year.

Table 42 Net New Vehicle Site Trip Generation (2029 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-25	-30	-55	-60	-90	-150
Total New Site Trips	130	350	480	300	255	555
Net New Site Trips	**105**	**320**	**425**	**240**	**165**	**405**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

Table 43 Net New Vehicle Site Trip Generation (2034 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-25	-30	-55	-60	-90	-150
Total New Site Trips	125	335	460	290	245	535
Net New Site Trips	**100**	**305**	**405**	**230**	**155**	**385**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

Table 44 Net New Vehicle Site Trip Generation (2039 Horizon Year)

Land Use	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Existing Site Trips (To Be Removed)	-25	-30	-55	-60	-90	-150
Total New Site Trips	120	315	435	275	230	505
Net New Site Trips	**95**	**285**	**380**	**215**	**140**	**355**

Notes:
1. All site trips are rounded to the nearest five (5).
2. The existing site traffic that is to be removed is denoted with a minus "-" sign.

12.4 Future Total Traffic Volumes

The future total traffic volumes on the study area road network represent the summation of future background traffic volumes and site traffic volumes in each respective horizon year. Future total traffic volumes in the 2029, 2034 and 2039 horizon years are illustrated in **Figure 33**, **Figure 34** and **Figure 35**, respectively.

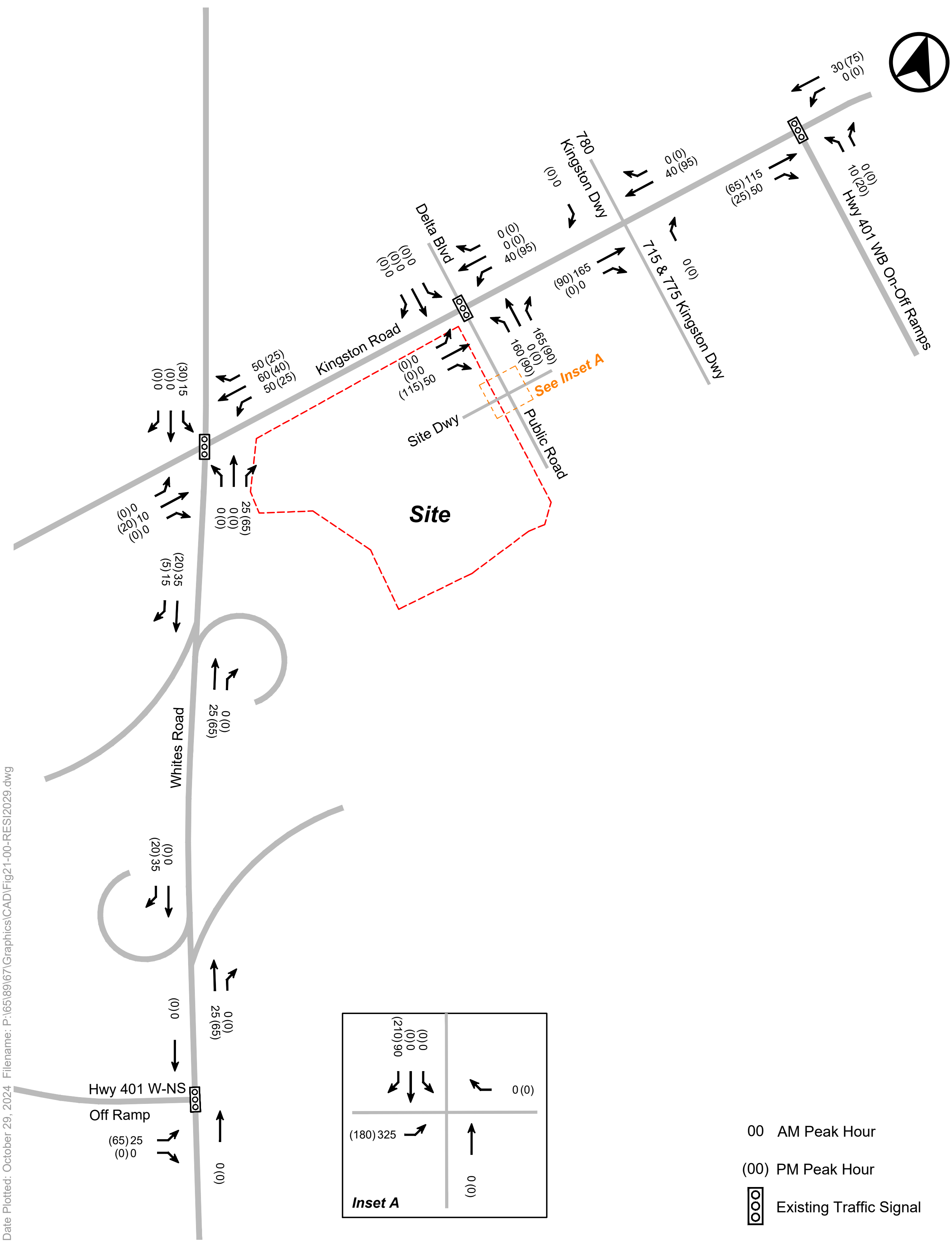

FIGURE 21 RESIDENTIAL SITE TRAFFIC VOLUMES (2029 HORIZON YEAR)

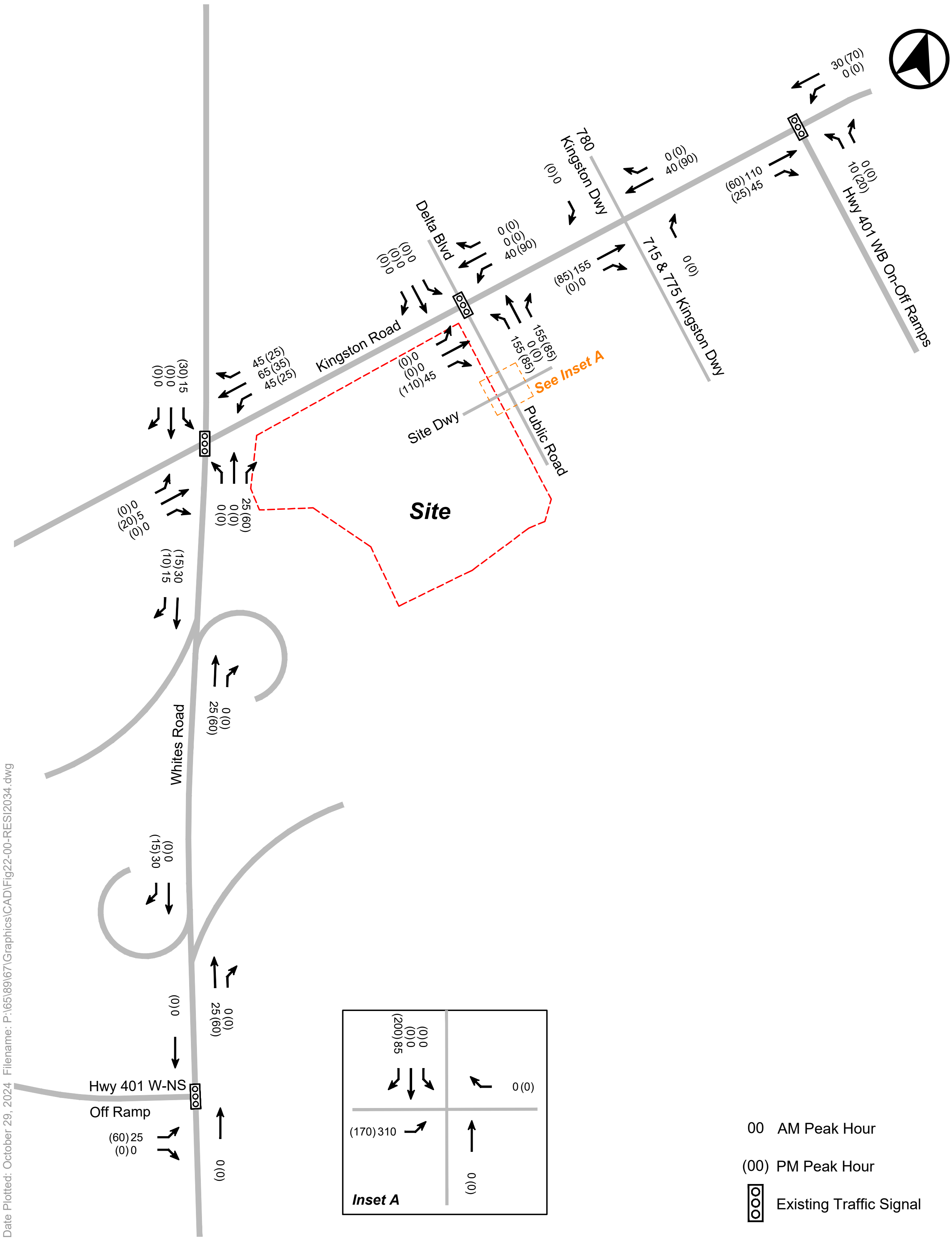

FIGURE 22 RESIDENTIAL SITE TRAFFIC VOLUMES (2034 HORIZON YEAR)

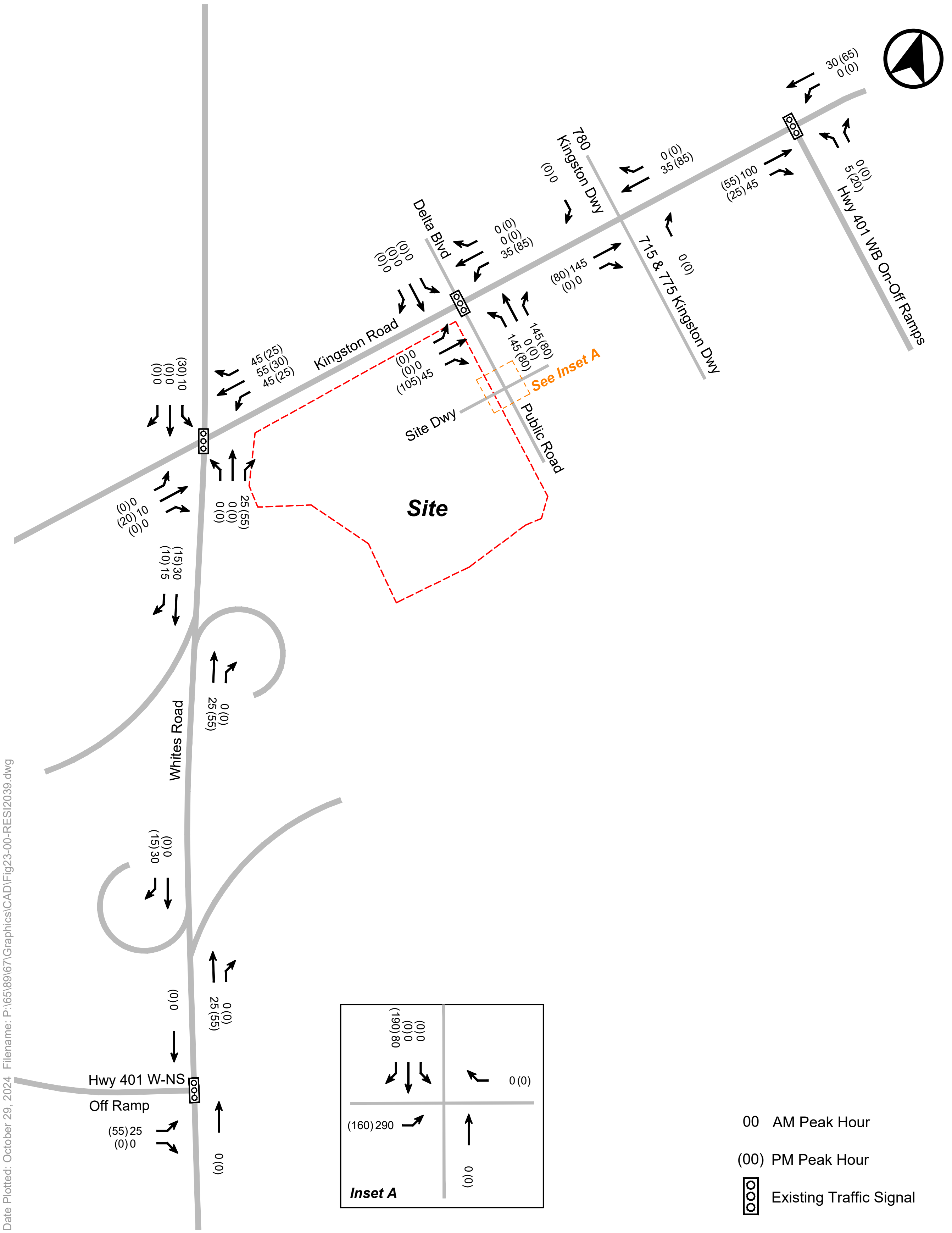

FIGURE 23 RESIDENTIAL SITE TRAFFIC VOLUMES (2039 HORIZON YEAR)

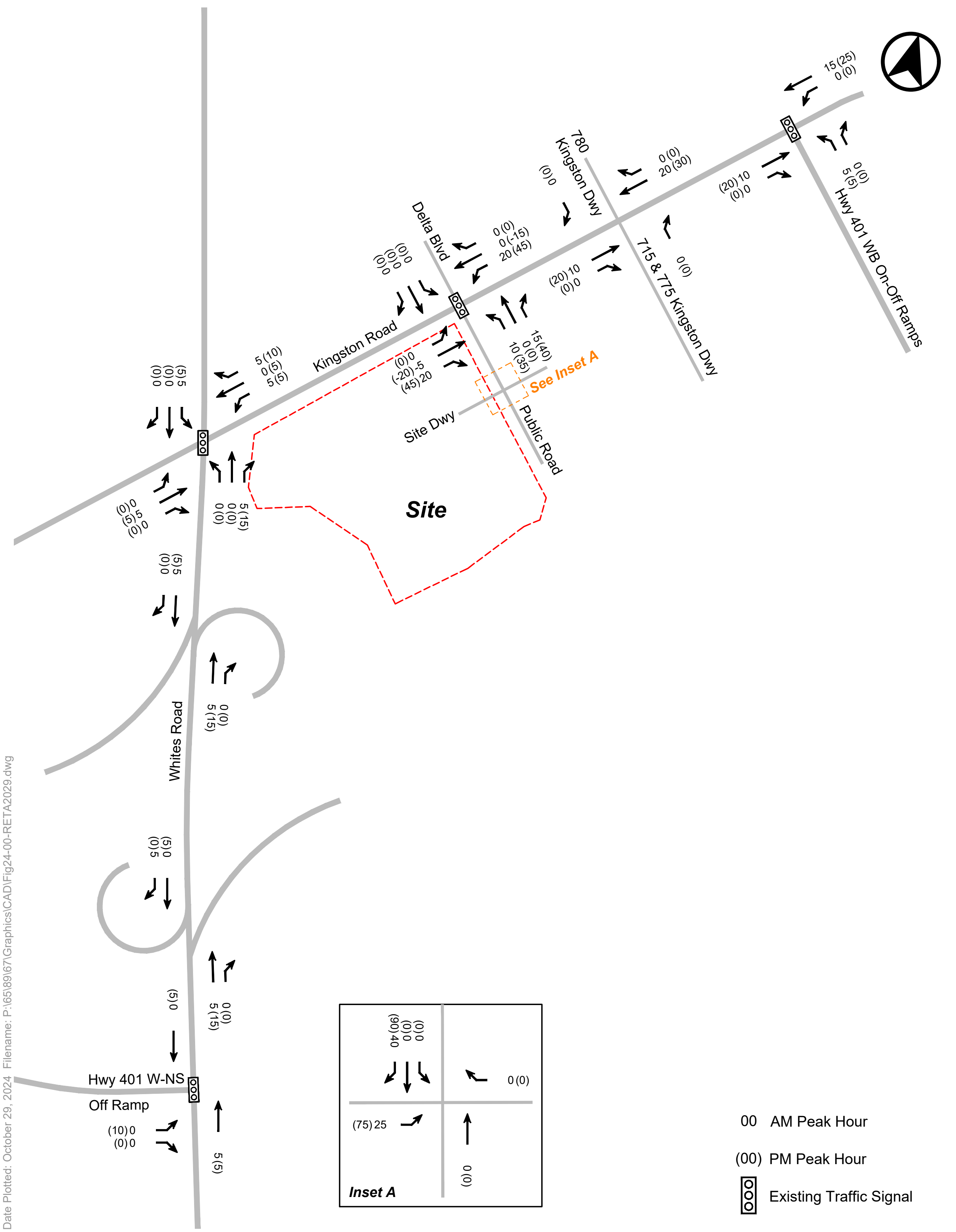

FIGURE 24 RETAIL SITE TRAFFIC VOLUMES (2029 HORIZON YEAR)

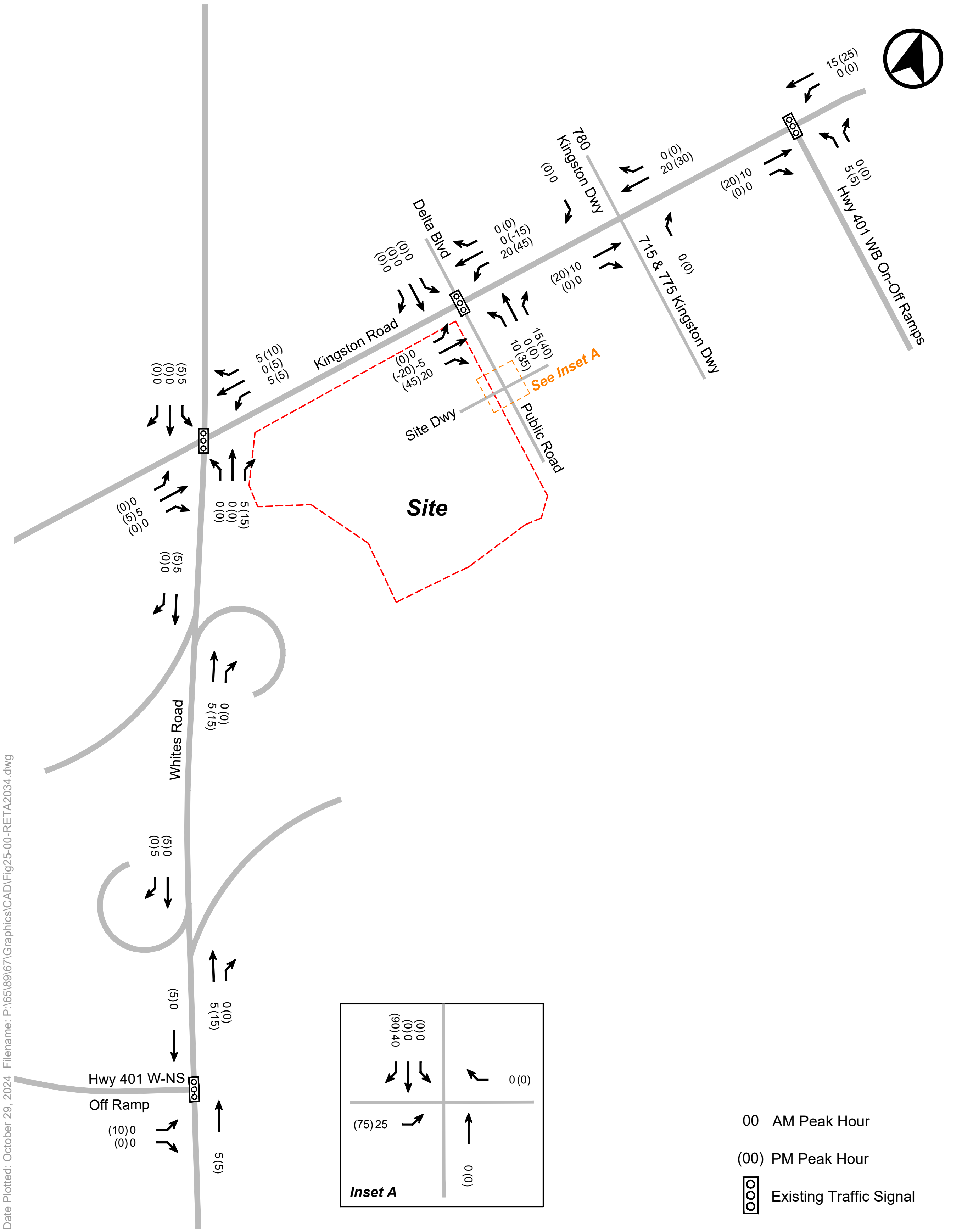

FIGURE 25 RETAIL SITE TRAFFIC VOLUMES (2034 HORIZON YEAR)

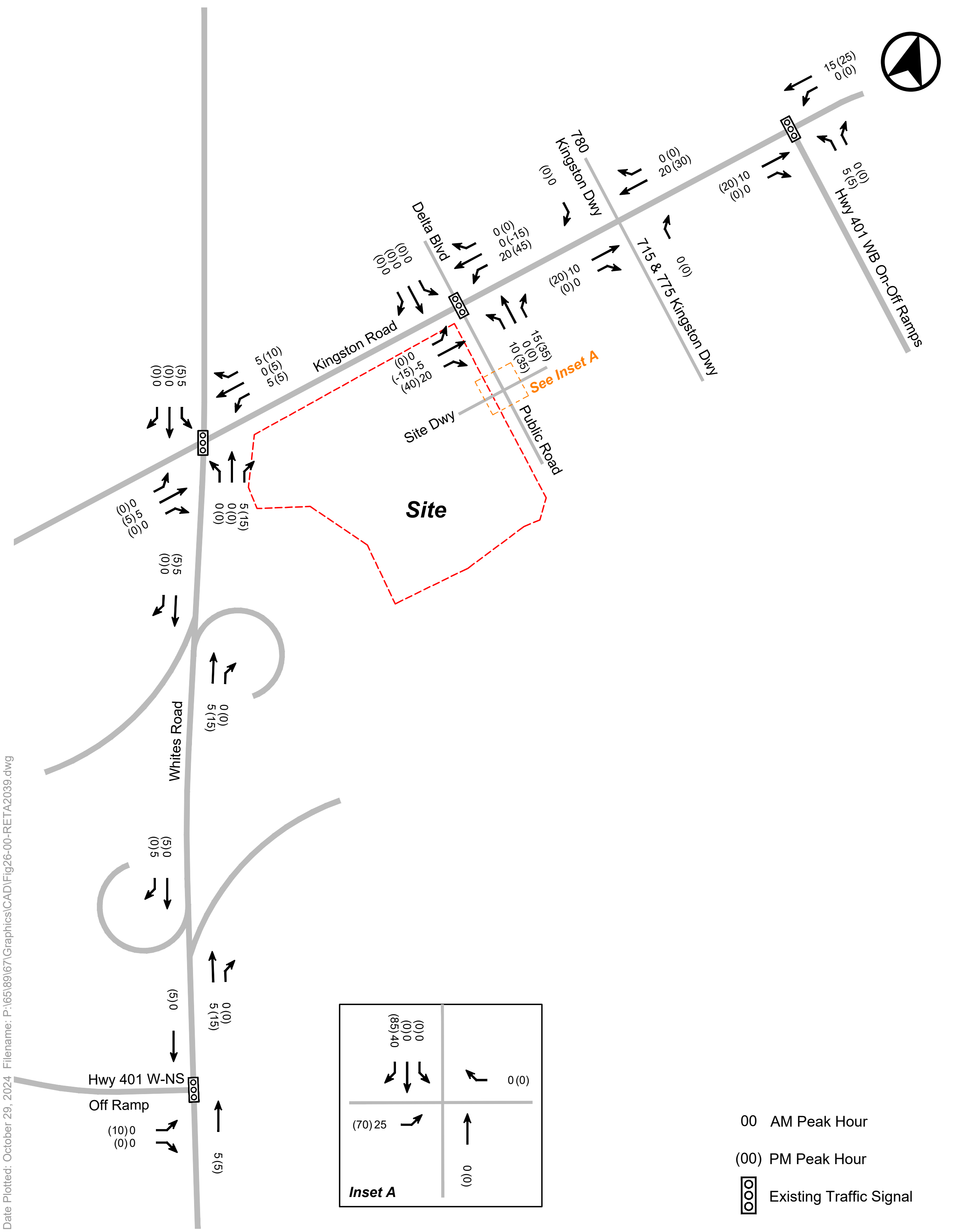

FIGURE 26 RETAIL SITE TRAFFIC VOLUMES (2039 HORIZON YEAR)

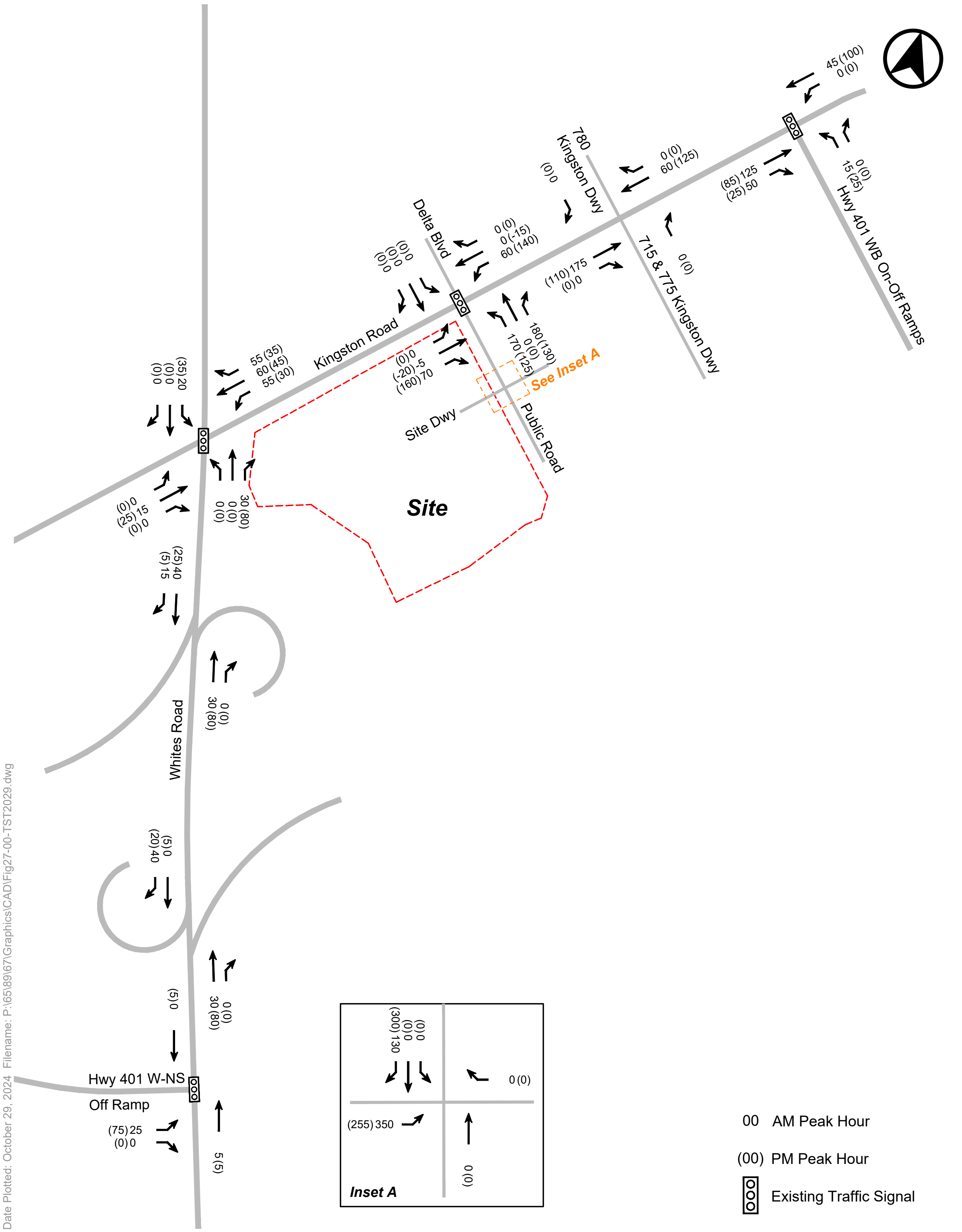

FIGURE 27 TOTAL SITE TRAFFIC VOLUMES (2029 HORIZON YEAR)

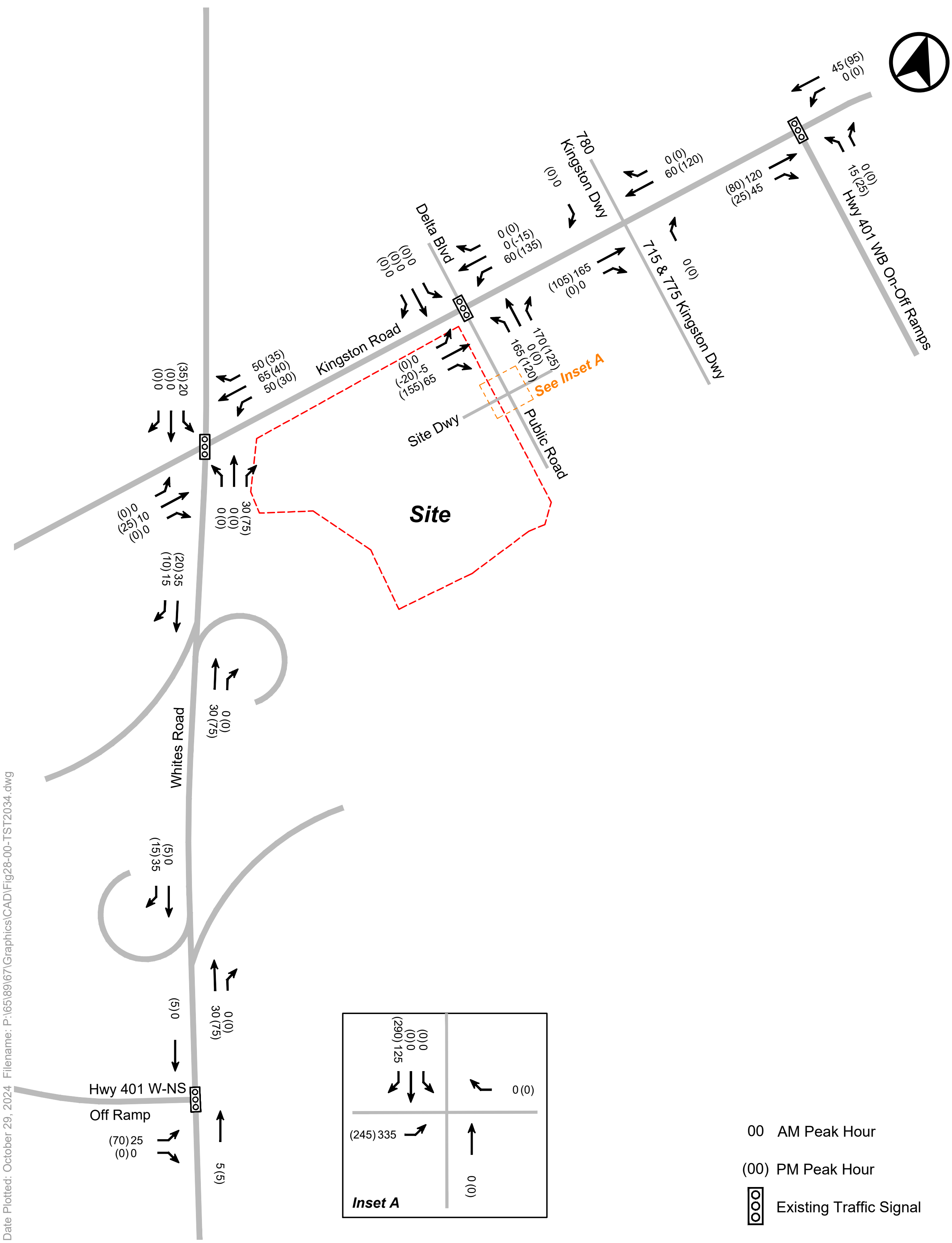

FIGURE 28 TOTAL SITE TRAFFIC VOLUMES (2034 HORIZON YEAR)

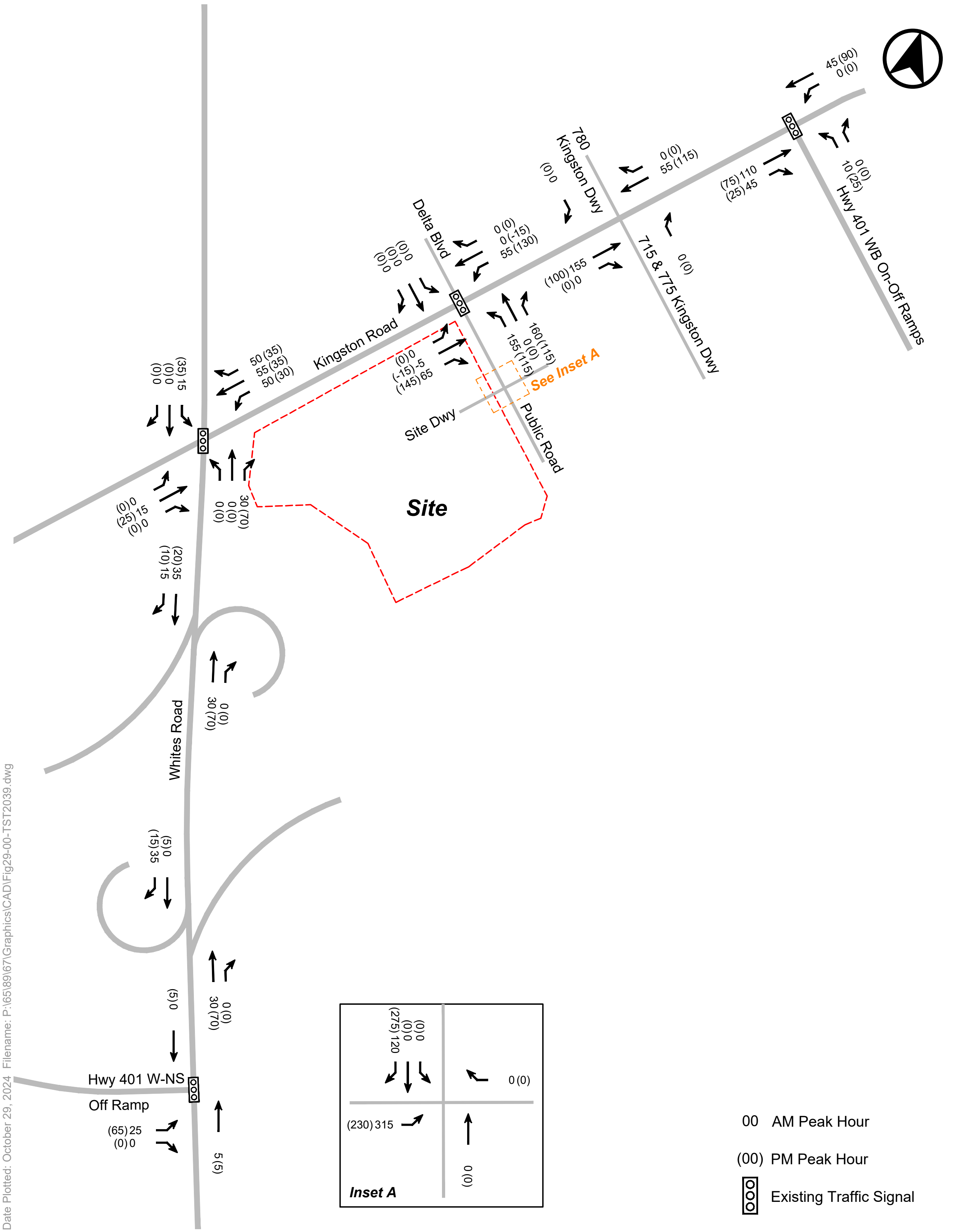

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FIGURE 29 TOTAL SITE TRAFFIC VOLUMES (2039 HORIZON YEAR)

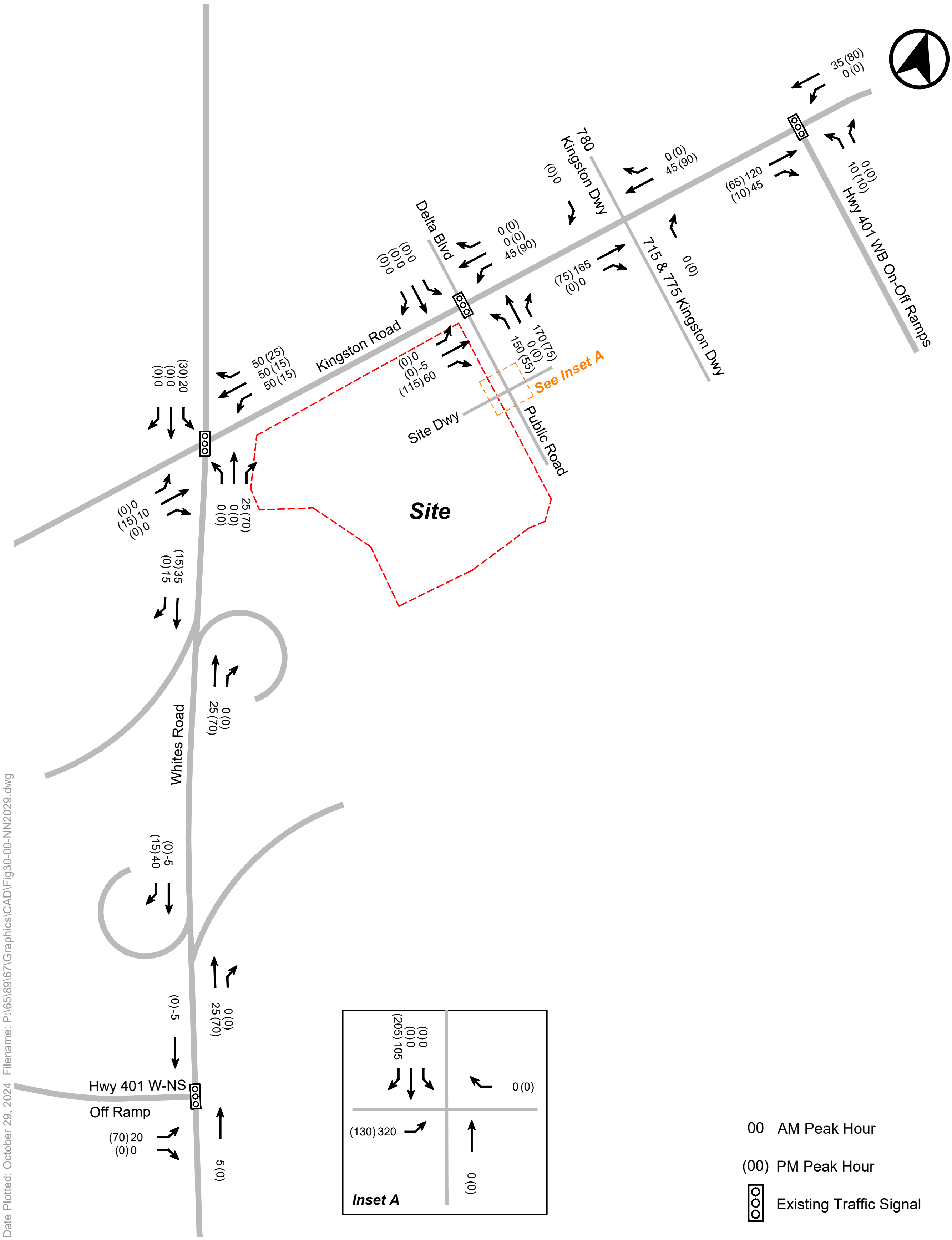

FIGURE 30 NET NEW SITE TRAFFIC VOLUMES (2029 HORIZON YEAR)

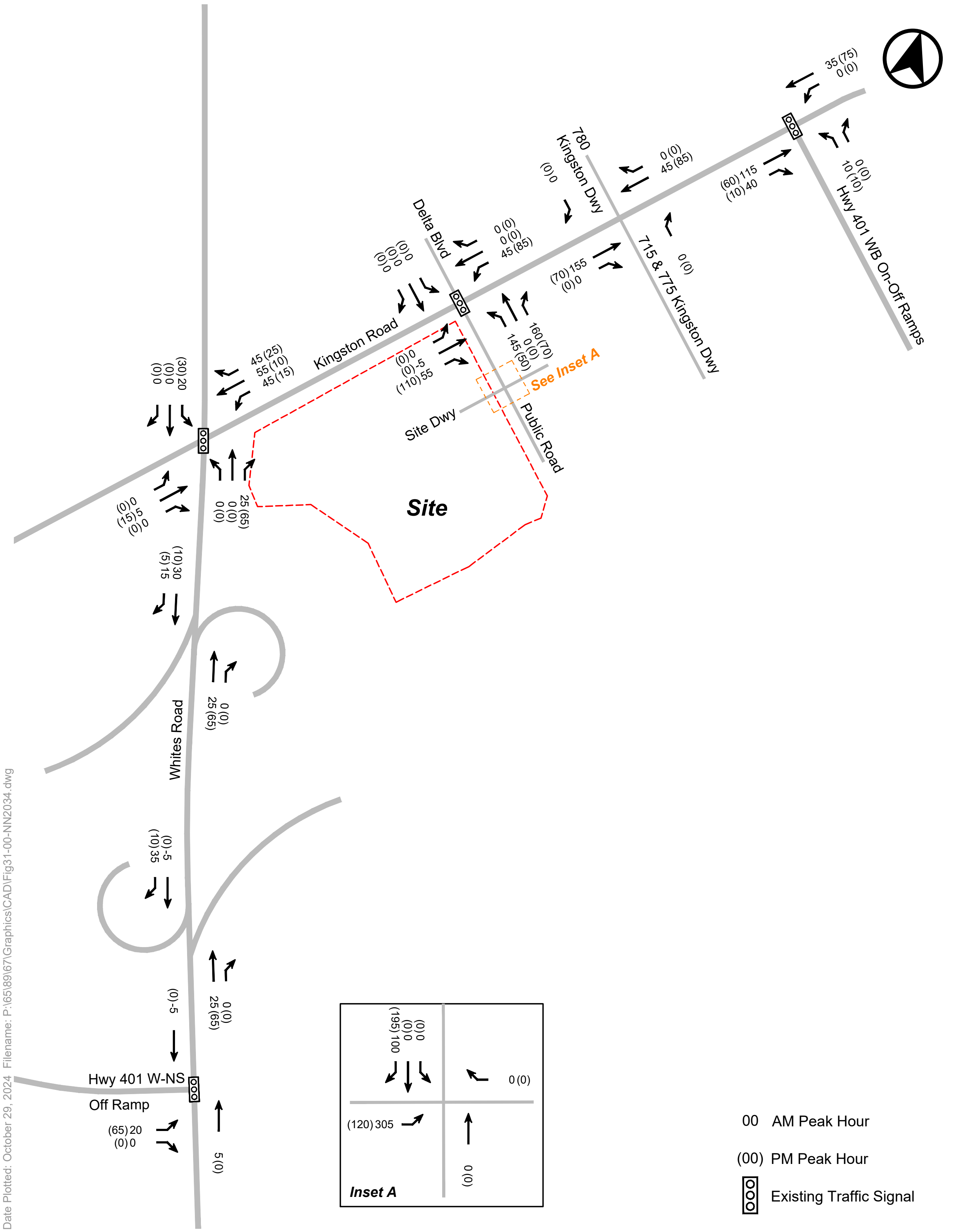

FIGURE 31 NET NEW SITE TRAFFIC VOLUMES (2034 HORIZON YEAR)

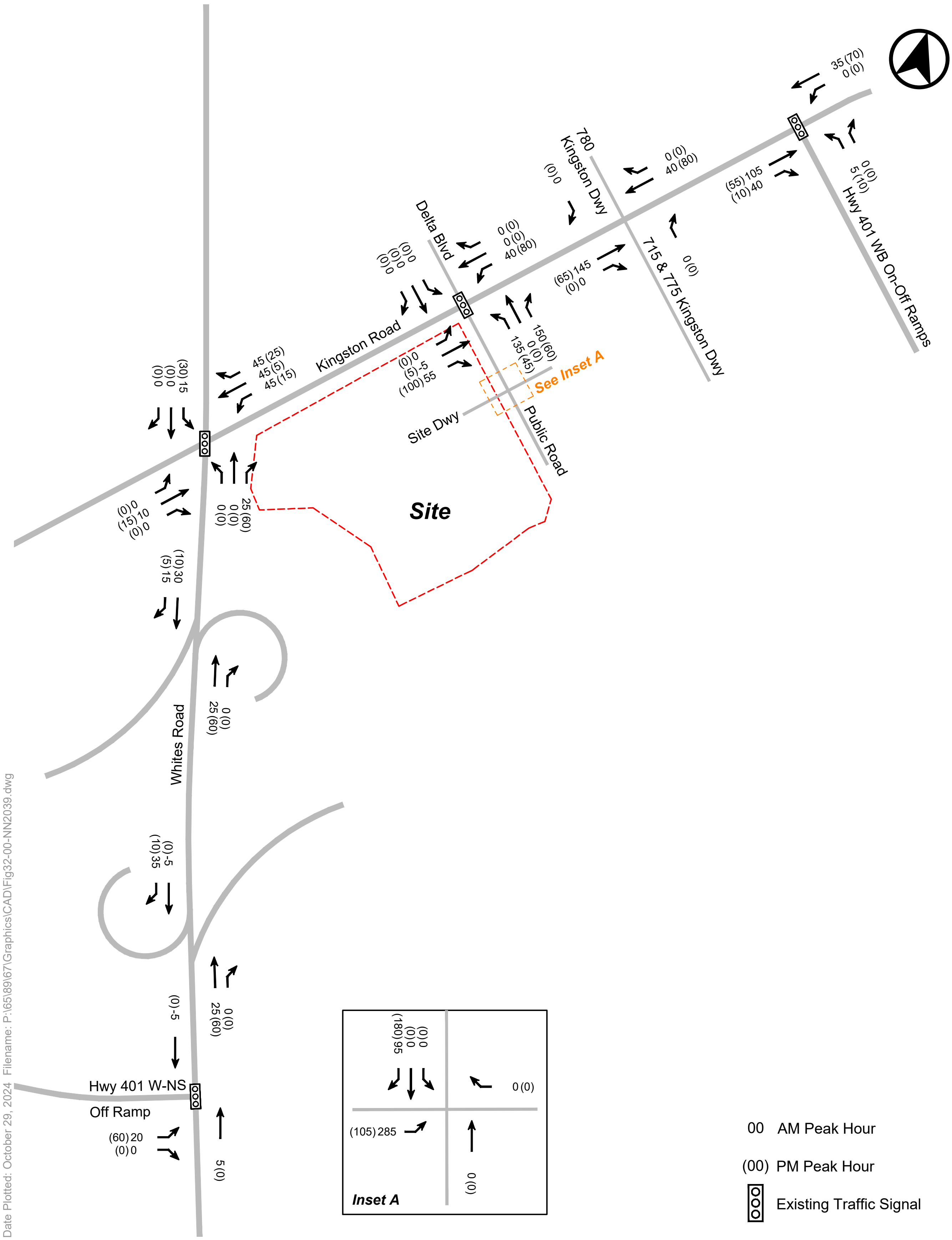

FIGURE 32 NET NEW SITE TRAFFIC VOLUMES (2039 HORIZON YEAR)

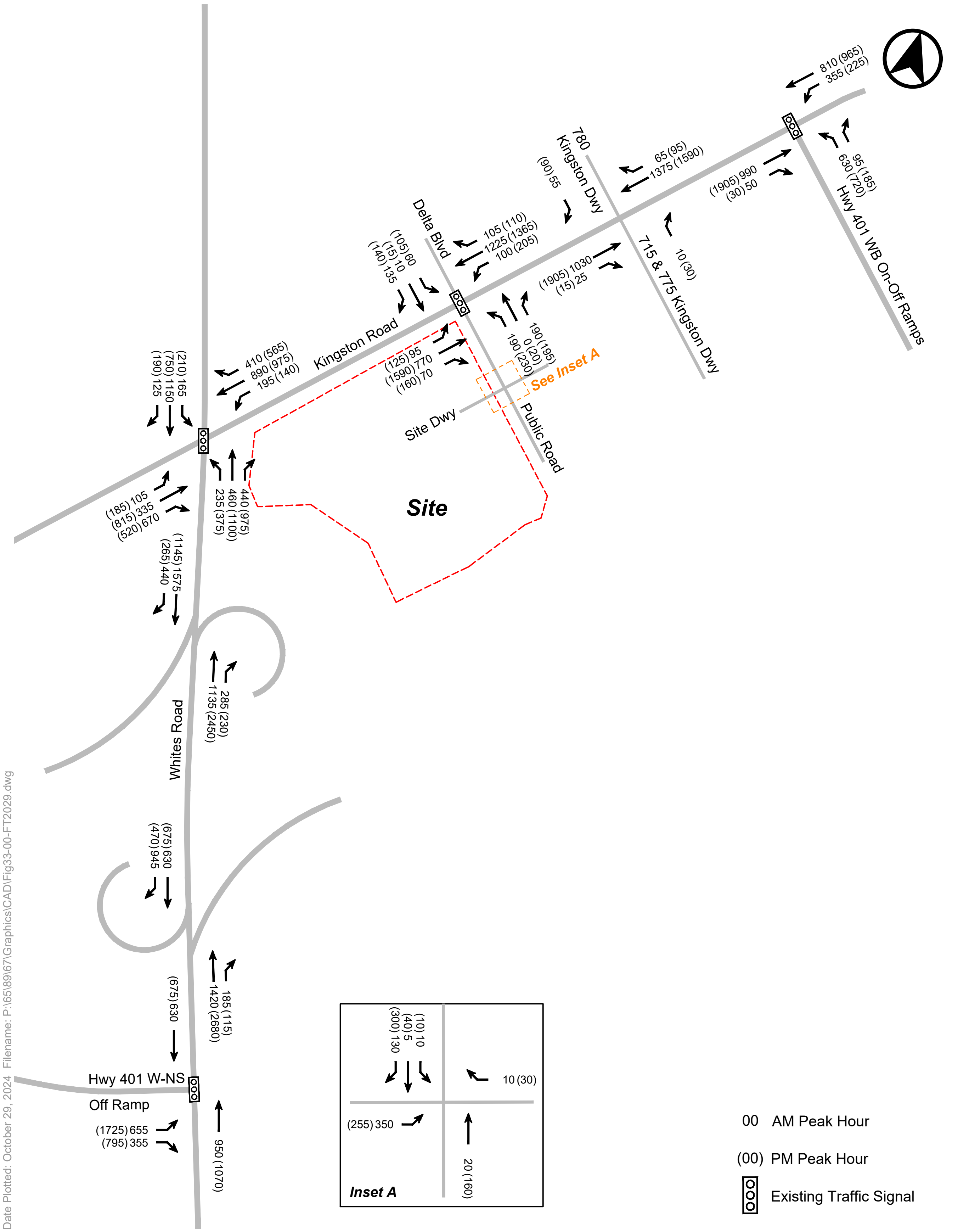

FIGURE 33 FUTURE TOTAL TRAFFIC VOLUMES (2029 HORIZON YEAR)

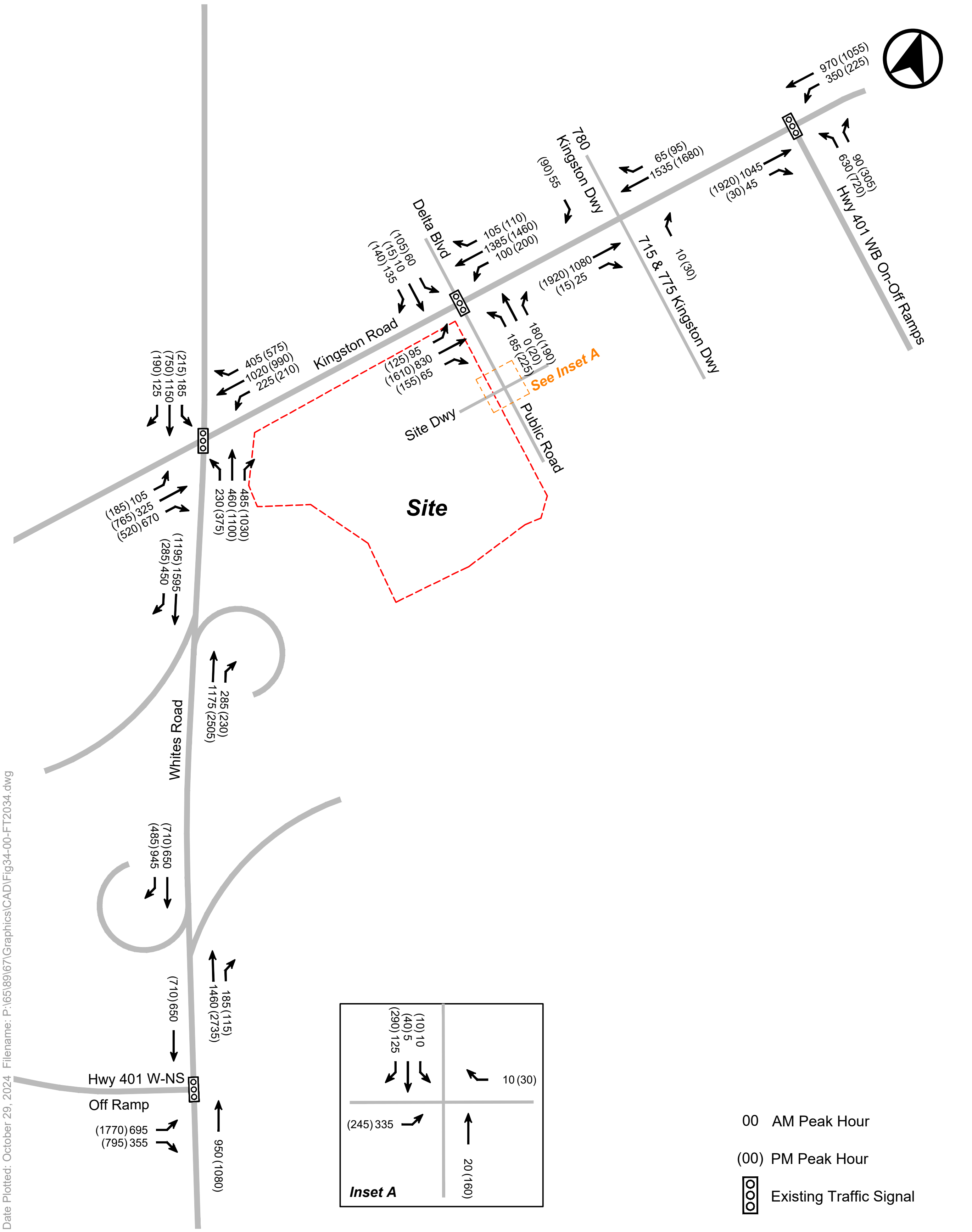

FIGURE 34 FUTURE TOTAL TRAFFIC VOLUMES (2034 HORIZON YEAR)

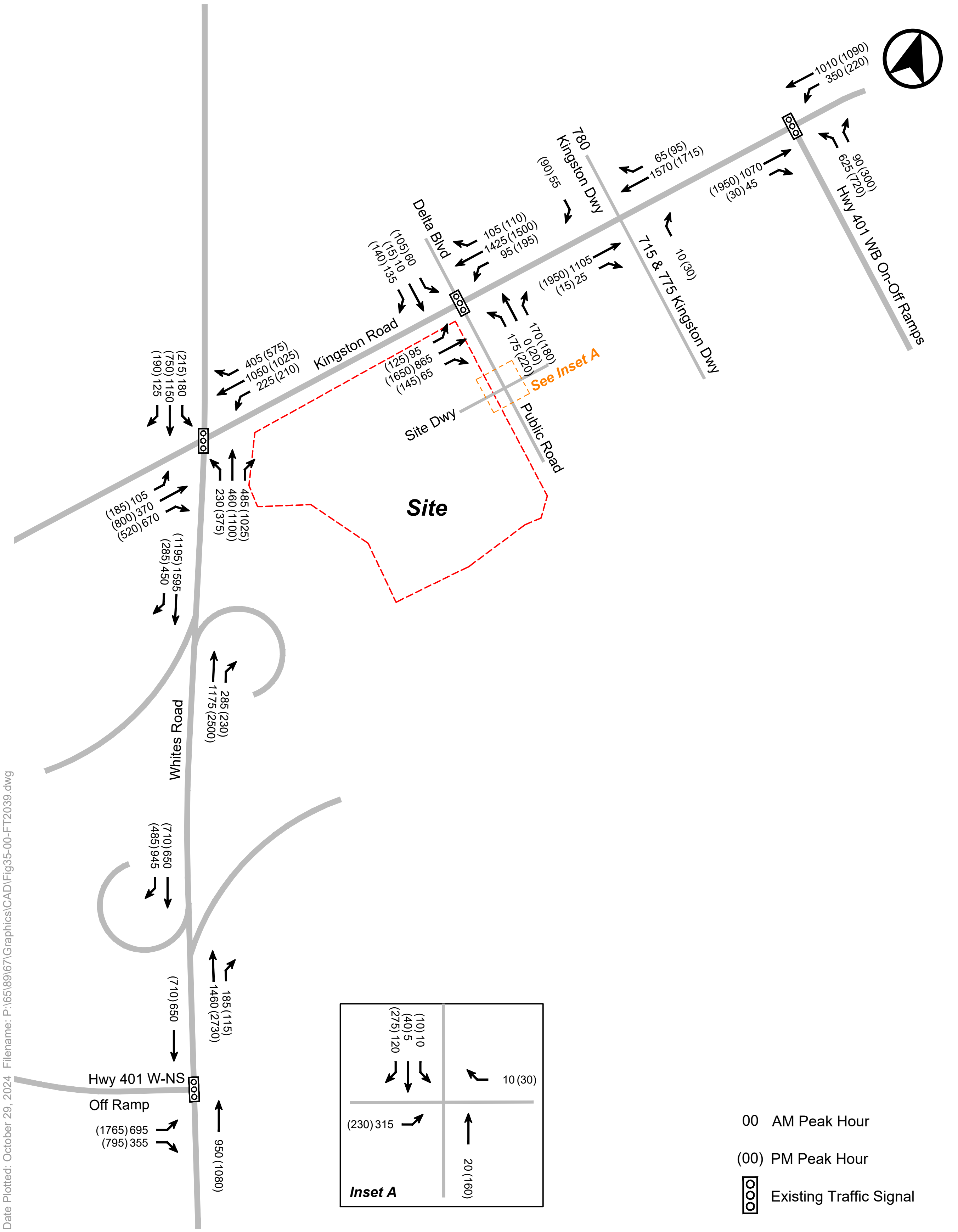

FIGURE 35 FUTURE TOTAL TRAFFIC VOLUMES (2039 HORIZON YEAR)

13.0 TRAFFIC OPERATIONS ANALYSIS

13.1 Analysis Methodology

The intersection capacity analysis was completed using Synchro Version 11.0 and the Highway Capacity Manual (HCM) methodology.

For signalized intersections, the volume-to-capacity ratio (v/c) is an indicator of the capacity utilization for the key movements in the intersection. A v/c of 1.00 indicates that certain governing traffic movements through the intersection are operating at or near maximum capacity. The primary overall level of service (LOS) indicator is delay, both on individual movements and expressed as an average for all vehicles processed. Many busy urban intersections operate at LOS D to E, which reflects average delays in the range of 35 to 80 seconds.

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of delay within the traffic stream. LOS A represents a good level of service with short delays. LOS F represents a poor level of service with long delays. The volume to capacity ratio (v/c) is an indicator of the capacity utilization for key movements at the intersection and resultant residual capacity potential.

The LOS criteria provided by the HCM methodology is summarized as follows:

1. Signalized Intersection LOS
   - LOS A: Control Delay ≤ 10s
   - LOS B: 10s < Control Delay ≤ 20s
   - LOS C: 20s < Control Delay ≤ 35s
   - LOS D: 35s < Control Delay ≤ 55s
   - LOS E: 55s < Control Delay ≤ 80s
   - LOS F: Control Delay > 80s
2. Unsignalized Intersection LOS
   - LOS A: Control Delay ≤ 10s
   - LOS B: 10s < Control Delay ≤ 15s
   - LOS C: 15s < Control Delay ≤ 25s
   - LOS D: 25s < Control Delay ≤ 35s
   - LOS E: 35s < Control Delay ≤ 50s
   - LOS F: Control Delay > 50s

13.2 Modelling Input and Calibration Parameters

13.2.1 Road Network Configuration

The existing conditions Synchro models adopt existing lane configurations.

Under future conditions and in each horizon year, based on the design plans from the Region, the centre median BRT and relevant intersection configurations have been revised. This includes the redistribution of all left turn movements onto or from Kingston Road at unsignalized intersections with the presence of the centre median. The incorporated design plans are provided in **Appendix F**.

Though and turn lane widths are coded as 3.5m and 3.25m as per the Region's *Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection*.

13.2.2 Signal Timing Plans

The existing signal timing plans that were provided by the Region for all signalized intersections were incorporated for existing conditions analysis. Input parameters such as minimum green times, cycle lengths, and pedestrian clearance times were adopted in the Synchro models. The signal timings are attached **Appendix K**.

Under future conditions with the BRT in operations, the following revisions have been made to the signal timing plans at intersections along Kingston Road:

- Coded fully protected left turns instead of protected and permitted left turns.
- North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) as well as intergreen times (i.e., amber and all-red) have been increased where the width of the intersection has increased.
- Increased cycle lengths to 140 seconds (instead of the current 120 seconds) at all signalized intersections along Kingston Road to account for the increased intergreen times and pedestrian crossing times. Cycle lengths at intersections of a similar context (such as at intersections along Highway 7 in the City of Markham with VIVA bus rapid transit) are up to 150 seconds.
- Revise the recall mode at study area intersections from Coordinated Maximum (C-Max) to Coordinated Minimum (C-Min), and those coded as Maximum (Max) to Minimum (Min). This provides flexibility to each signal phase from its minimum split time, rather than forcing maximum splits along both the east-west and north-south travel directions at the study area intersections (which would effectively act as fixed timing). From observing the signal timings in the field, it appears as though signal timings are operating under coordinated minimum and minimum times, given that there is fluctuation in split times at the study area's signalized intersections. However, the received Synchro model signal timings provided by the Region all code C-Max and Max recall modes. This does not seem to reflect field conditions.

13.2.3 Other Data Inputs

Heavy vehicle percentages and pedestrian and bicycle crossing volumes were derived from existing traffic counts. Where field data was not available, default values in the Synchro models were adopted.

13.2.4 Lost Time Adjustment

For all signalized intersections, a lost time adjustment (LTA) of -1.0 seconds was applied to all movements. This lost time adjustment provides allowances in the capacity analysis to better account for drivers completing their movements during amber or all-red time (a common phenomenon especially at busy intersections). It is typical for drivers to continue progressing into the intersection during intergreen times to complete their movements. It is often observed that lost time adjustment values could equal up to the total intergreen time (especially the amber times) since drivers may take the full amber period to advance into the intersection, but this was not assumed for the purposes of conservative analysis. The adoption of an LTA value of -1.0 seconds for all movements is also recommended in the City of Toronto's *Guidelines for Using Synchro 11*.

In addition to the baseline adoption of -1.0 seconds, several intergreen studies were conducted to better represent existing intergreen behaviour at several intersections in the study area.

This includes the northbound and southbound left turn at Kingston Road / Whites Road, the eastbound left turn at Whites Road / Highway 401 W-NS Off-Ramp and the northbound and westbound left turns at Kingston Road / Highway 401 E-EW Off-Ramp. The results of the intergreen studies are provided in **Table 45**. To replicate current intergreen behaviour that was observed in the field, in the order of -1.0 seconds of LTA was added for each observed intergreen vehicle.

Table 45 Surveyed Intergreen Behaviour

Intersection	Movement	Observed Number of Sneakers	Applied Lost Time Adjustment (sec.)
Kingston Road / Whites Road	Northbound Left Turn	2.61 (3.53)	-2.5 (-3.0)
Kingston Road / Whites Road	Southbound Left Turn	0.65 (2.87)	-1.0 (-3.0)
Whites Road / Highway 401 W-NS Off-Ramp	Eastbound Left Turn	0.76 (3.33)	-1.0 (-3.5)
Kingston Road / Highway 401 E-EW Off-Ramp	Northbound Left Turn	1.23 (3.73)	-1.0 (-3.5)
Kingston Road / Highway 401 E-EW Off-Ramp	Westbound Left Turn	1.17 (2.07)	-1.0 (-2.0)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table presents the average number of sneakers observed per cycle over the course of the peak hour.

13.2.5 Protected Left Turn Factor

The protected left turn factor ("LTF") in the Synchro model influences the headways between vehicles making a left turn movement on protected left turn green phases. Values closer to 1.00 represent vehicles making left turns with smaller headways. Drivers are expected modify their behaviour in near-capacity conditions and operate with reduced headways. As such, a protected LTF of 1.00 (rather than a default of 0.95) has been adopted for all protected left turns at the study area intersections.

13.2.6 Peak Hour Factor

Under existing conditions, the peak hour factor ("PHF") at all study area intersections is based on the collected traffic count data. As future travel conditions continue to evolve and adjust to the new study area road network with the BRT along Kingston Road, it is expected that the Kingston Road corridor will continue to approach capacity. Over time, vehicle trips can begin to equalize their distribution across the different peak 15-minute periods within the peak hour, while non-local drivers will be encouraged to use alternative routes outside of the study area road network. This shift would result in an increasingly even distribution of trips over the course of the peak hour as drivers make trips earlier or later to reduce delays. During the data collection process, several peak hour factors in proximity to the site were already observed to be approaching 1.00, including the Kingston Road / Whites Road intersection. Given that significant background growth in the area is expected, a peak hour factor of 1.00 is assumed at all intersections to represent the full potential of the road network during peak hours. A similar adjustment is also recommended by the Region of Peel's Synchro Guidelines.

13.2.7 Right Turn on Red Study

A right turn on red study ("RTOR") was conducted at the Kingston Road / Whites Road and Whites Road / Highway W-NS Off-Ramp intersections to better capture the number of observed right turns during the red time. The model's RTOR value was calibrated to the actual RTOR observed at the intersections' movements by adjusting the saturation flow rate of the RTOR. The RTOR calibration parameters for the Kingston Road / Whites Road and Whites Road / Highway W-NS Off-Ramp intersections are summarized in **Table 46** and **Table 47**, respectively. The right turn on red studies are included in **Appendix L**.

Table 46 Kingston Road / Whites Road – Northbound Right Turn on Red Study

Parameters	Weekday AM Peak Hour	Weekday PM Peak Hour
Right Turn on Red – Observed Count	158	325
Default RTOR Saturated Flow Rate	357	63
Right Turn on Red – Model Default[1]	174	132
Adjusted RTOR Saturated Flow Rate	357 (not changed from default)	671
Right Turn on Red – Calibrated Model	174 (not changed from default)	326

Notes:
1. Default values are recorded from the Synchro model at the intersection.

Table 47 Whites Road / Highway W-NS Off-Ramp – Eastbound Right Turn on Red Study

Parameters	Weekday AM Peak Hour	Weekday PM Peak Hour
Right Turn on Red – Observed Count	191	164
Default RTOR Saturated Flow Rate	252	118
Right Turn on Red – Model Default[1]	182	58
Adjusted RTOR Saturated Flow Rate	268	338
Right Turn on Red – Calibrated Model	193	165

Notes:
1. Default values are recorded from the Synchro model at the intersection.

13.3 Analysis Scenarios

The following analysis scenarios were reviewed for the weekday morning and afternoon peak hours:

1. 2024 Baseline existing traffic conditions (as illustrated in **Figure 13**)
2. 2029 Future background traffic conditions (as illustrated in **Figure 17**)
3. 2029 Future total traffic conditions (as illustrated in **Figure 33**)
4. 2034 Future background traffic conditions (as illustrated in **Figure 18**)
5. 2034 Future total traffic conditions (as illustrated in **Figure 34**)
6. 2039 Future background traffic conditions (as illustrated in **Figure 19**)
7. 2039 Future total traffic conditions (as illustrated in **Figure 35**)

All Synchro worksheets for the scenarios are provided in **Appendix L**.

13.4 Signalized Intersection Analysis

13.4.1 Kingston Road / Whites Road

The Kingston Road / Whites Road intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 48**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.62 and 0.74 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2029 Horizon Year

In future background conditions in the 2029 horizon year, the intersection operates at near but under capacity conditions at overall v/c ratios of 0.82 and 0.84 during the weekday morning and afternoon peak hours, respectively. Busy movements (identified as any movements with v/c of 0.90 or above) include the northbound left turn, as it operates with v/c of 0.95 in the weekday afternoon peak hour.

With the site redevelopment, the intersection will continue to operate at near but under capacity conditions at overall v/c ratios of 0.85 and 0.91 during the weekday morning and afternoon peak hours, respectively. Busy movements include the northbound left turn and southbound left turn.

2034 Horizon Year

In future background conditions in the 2034 horizon year, the intersection operates at near but under capacity conditions at overall v/c ratios of 0.84 and 0.88 during the weekday morning and afternoon peak hours, respectively. Busy movements include the northbound left turn.

With the site redevelopment, the intersection will continue to operate at near but under capacity conditions at overall v/c ratios of 0.87 and 0.95 during the weekday morning and afternoon peak hours, respectively. Busy movements include almost all left turning movements and the westbound right turn.

Table 48 Kingston Road / Whites Road – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.30 (0.58)	C (C)	0.70 (0.83)	E (F)	0.71 (0.85)	E (F)	0.76 (0.85)	F (F)	0.75 (0.92)	F (F)
EBT	0.27 (0.62)	C (D)	0.32 (0.61)	D (D)	0.34 (0.64)	D (D)	0.32 (0.61)	D (D)	0.34 (0.65)	D (D)
EBR	0.51 (0.45)	D (C)	0.84 (0.59)	D (D)	0.87 (0.62)	D (D)	0.86 (0.67)	D (D)	0.89 (0.70)	D (D)
WBL	0.67 (0.69)	C (C)	0.67 (0.58)	E (E)	0.79 (0.62)	F (E)	0.76 (0.77)	E (F)	0.86 (0.80)	F (E)
WBT	0.52 (0.61)	C (C)	0.73 (0.73)	C (D)	0.76 (0.76)	D (D)	0.82 (0.75)	D (D)	0.86 (0.76)	D (D)
WBR	0.24 (0.75)	D (C)	0.29 (0.83)	D (D)	0.39 (0.88)	D (D)	0.31 (0.84)	D (D)	0.38 (0.90)	D (E)
NBL	0.67 (0.78)	C (C)	0.58 (0.95)	C (E)	0.58 (0.95)	C (E)	0.56 (0.95)	C (E)	0.57 (0.95)	C (E)
NBT	0.25 (0.64)	C (D)	0.25 (0.67)	C (D)	0.26 (0.65)	C (D)	0.25 (0.66)	C (D)	0.25 (0.64)	C (D)
NBR	0.30 (0.65)	B (C)	0.36 (0.74)	B (C)	0.40 (0.82)	B (D)	0.41 (0.80)	B (C)	0.45 (0.87)	B (D)
SBL	0.34 (0.71)	C (C)	0.39 (0.79)	C (D)	0.43 (0.90)	C (E)	0.44 (0.81)	C (D)	0.49 (0.93)	C (E)
SBT	0.67 (0.45)	C (C)	0.84 (0.61)	D (D)	0.85 (0.57)	D (D)	0.84 (0.59)	D (D)	0.84 (0.55)	D (D)
SBR	0.08 (0.11)	C (C)	0.08 (0.15)	D (D)	0.08 (0.15)	D (D)	0.08 (0.15)	D (D)	0.08 (0.15)	D (D)
Overall	**0.62 (0.74)**	**C (C)**	**0.82 (0.84)**	**D (D)**	**0.85 (0.91)**	**D (D)**	**0.84 (0.88)**	**D (D)**	**0.87 (0.95)**	**D (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.

13.4.2 Kingston Road / Delta Boulevard

The Kingston Road / Delta Boulevard intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 49**.

Under existing conditions, the intersection operates under capacity at overall v/c ratios of 0.45 and 0.72 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2029 Horizon Year

In future background conditions in the 2029 horizon year, the intersection operates under capacity at overall v/c ratios of 0.54 and 0.80 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection continues to operate under capacity at overall v/c ratios of 0.70 and 0.95 during the weekday morning and afternoon peak hours, respectively. The intersection will be near capacity in the weekday afternoon peak hour, with busy movements including the eastbound through and northbound left turn.

2034 Horizon Year

In future background conditions in the 2034 horizon year, the intersection operates under capacity conditions at overall v/c ratios of 0.59 and 0.81 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the intersection continues to operate under capacity at overall v/c ratios of 0.75 and 0.94 during the weekday morning and afternoon peak hours, respectively. The intersection will be near capacity in the weekday afternoon peak hour, with busy movements including the eastbound through and northbound left turn.

Table 49 Kingston Road / Delta Boulevard – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	**E.X.**	**E.X.**	**F.B.**	**F.B.**	**F.T.**	**F.T.**	**F.B.**	**F.B.**	**F.T.**	**F.T.**
Parameter:	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**
EBL	0.25 (0.46)	A (C)	0.53 (0.68)	E (E)	0.59 (0.75)	E (F)	0.53 (0.68)	E (E)	0.59 (0.75)	E (E)
EBT (E.X.)	0.28 (0.68)	A (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBR (E.X.)	0.01 (0.03)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBTR (F.B./F.T.)	-- (--)	-- (--)	0.32 (0.81)	A (C)	0.44 (0.98)	B (D)	0.34 (0.82)	A (C)	0.46 (0.98)	B (D)
WBL	0.04 (0.37)	A (B)	0.49 (0.63)	E (E)	0.61 (0.89)	E (F)	0.49 (0.63)	E (E)	0.61 (0.87)	E (F)
WBT (E.X.)	0.46 (0.64)	A (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBR (E.X.)	0.08 (0.09)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBTR (F.B./F.T.)	-- (--)	-- (--)	0.55 (0.73)	B (C)	0.67 (0.78)	C (C)	0.62 (0.78)	B (C)	0.74 (0.82)	C (C)
NBL	0.51 (0.92)	E (F)	0.48 (0.84)	E (E)	0.82 (0.91)	E (F)	0.48 (0.85)	E (E)	0.81 (0.90)	E (F)
NBTR	0.01 (0.14)	D (D)	0.01 (0.13)	E (D)	0.13 (0.22)	D (D)	0.01 (0.13)	E (D)	0.13 (0.21)	D (D)
SBLTR	0.34 (0.32)	D (D)	0.34 (0.29)	E (D)	0.20 (0.28)	D (D)	0.34 (0.30)	E (D)	0.20 (0.29)	D (D)
Overall	**0.45 (0.72)**	**B (B)**	**0.54 (0.80)**	**B (C)**	**0.70 (0.95)**	**C (D)**	**0.59 (0.81)**	**B (C)**	**0.75 (0.94)**	**C (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.

13.4.3 Kingston Road / Highway 401 E-EW Off-Ramp

The Kingston Road / Highway 401 E-EW Off-Ramp intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 50**.

Under existing conditions, the off-ramp operates under capacity at overall v/c ratios of 0.53 and 0.83 during the weekday morning and afternoon peak hours, respectively.

Under all future horizon years, the BRT and its relevant network changes have been considered in the Synchro models. As previously noted, increases to the signal cycle length to 140 seconds and general signal timing optimization is recommended in both peak hours as part of the BRT construction.

2029 Horizon Year

In future background conditions in the 2029 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.71 and 0.93 during the weekday morning and afternoon peak hours, respectively. Busy movements include the eastbound through-right and westbound left turn in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.77 and 0.96 during the weekday morning and afternoon peak hours, respectively. Busy movements include the eastbound through-right and westbound left turn in the weekday afternoon peak hour.

2034 Horizon Year

In future background conditions in the 2034 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.72 and 0.93 during the weekday morning and afternoon peak hours, respectively. Busy movements include the eastbound through-right and westbound left turn in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.78 and 0.96 during the weekday morning and afternoon peak hours, respectively. Busy movements include the eastbound through-right (operating at v/c of 0.99) and westbound left turn in the weekday afternoon peak hour.

Table 50 Kingston Road / Highway 401 E-EW Off-Ramp – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTR	0.42 (0.87)	B (B)	0.58 (0.96)	C (C)	0.68 (0.99)	B (C)	0.61 (0.97)	C (C)	0.71 (0.99)	B (C)
WBL	0.60 (0.76)	B (D)	0.85 (0.93)	E (F)	0.86 (0.97)	E (F)	0.85 (0.93)	E (F)	0.85 (0.97)	E (F)
WBT	0.28 (0.35)	A (A)	0.32 (0.36)	A (A)	0.34 (0.39)	A (A)	0.39 (0.40)	A (A)	0.40 (0.43)	A (A)
NBL	0.77 (0.82)	D (D)	0.81 (0.88)	E (E)	0.84 (0.89)	E (E)	0.82 (0.88)	E (E)	0.85 (0.89)	E (E)
NBR	0.06 (0.13)	D (D)	0.12 (0.28)	D (D)	0.12 (0.28)	D (D)	0.11 (0.46)	D (D)	0.12 (0.47)	D (D)
Overall	**0.53 (0.83)**	**C (C)**	**0.71 (0.93)**	**C (C)**	**0.77 (0.96)**	**C (C)**	**0.72 (0.93)**	**C (C)**	**0.78 (0.96)**	**C (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.

2039 Horizon Year

As per the submitted Terms of Reference and the Ministry of Transportation Ontario (MTO)’s Traffic Impact Study Guidelines, capacity analysis was also provided for the Kingston Road / Highway 401 E-EW Off-Ramp intersection in the 2039 horizon year, summarized in **Table 51**. In future background conditions in the 2039 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.74 and 0.94 during the weekday morning and afternoon peak hours, respectively. Busy movements continue to include the shared eastbound through-right (v/c of 0.98) and westbound left (v/c of up to 0.94) in the weekday afternoon peak hour.

With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.79 and 0.97 during the weekday morning and afternoon peak hours, respectively. The shared eastbound through-right is projected to operate over capacity at v/c of 1.01 in the weekday afternoon peak hour, while operating acceptably in the weekday morning peak hour.

Notwithstanding these future conditions, no further mitigation measures are recommended at this time. It is noteworthy that the capacity constraints only occur during the weekday afternoon peak hour, while morning peak hours yield acceptable operations. The eastbound right turn volumes are also relatively low (up to 30-45 vehicles per peak hour, less than 1 vehicle per minute). Given such low volumes, it would not be reasonable to propose any additional intersection improvements (such as an additional eastbound right turn lane, especially since that increases conflicts with pedestrians and cyclists in the study area). Traffic operations in the study area should be monitored especially as the impacts of the Kingston BRT are more fully realized. Should the need arise, other opportunities to enter Highway 401 are provided either along Whites Road (those on-ramps are free-flow) or further westwards. Site-related impacts on the shared eastbound through-right are minimal (in the order of 3%) in the weekday afternoon peak hour.

Table 51 Kingston Road / Highway 401 E-EW Off-Ramp – 2039 Horizon Capacity Analysis Results

Horizon:	2039	2039	2039	2039
Scenario:	Future Background	Future Background	Future Total	Future Total
Parameter:	V/C	LOS	V/C	LOS
EBTR	0.63 (0.98)	C (C)	0.72 (1.01)	B (C)
WBL	0.85 (0.94)	E (F)	0.85 (0.94)	E (F)
WBT	0.40 (0.41)	A (A)	0.42 (0.44)	A (A)
NBL	0.83 (0.88)	E (E)	0.85 (0.89)	E (E)
NBR	0.11 (0.46)	D (D)	0.12 (0.46)	D (D)
Overall	**0.74 (0.94)**	**C (C)**	**0.79 (0.97)**	**C (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

13.4.4 Whites Road / Highway 401 W-NS Off-Ramp

The Whites Road / Highway 401 W-NS Off-Ramp intersection operates under traffic signal control. The results of the traffic analysis are provided in **Table 52**.

Under existing conditions, the off-ramp operates under capacity at overall v/c ratios of 0.53 and 0.83 during the weekday morning and afternoon peak hours, respectively.

Under all future conditions in the weekday afternoon peak hour, signal timing optimization is recommended within the current cycle length of 100 seconds.

2029 Horizon Year

In future background conditions in the 2029 horizon year, the off-ramp operates under capacity at overall v/c ratios of 0.52 and 0.86 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the off-ramp will continue to operate under capacity conditions at overall v/c ratios of 0.53 and 0.88 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound left-right, as it operates with v/c of 0.91 in the weekday afternoon peak hour.

2034 Horizon Year

In future background conditions in the 2029 horizon year, the off-ramp operates under capacity at overall v/c ratios of 0.53 and 0.88 during the weekday morning and afternoon peak hours, respectively.

With the site redevelopment, the off-ramp will continue to operate under capacity conditions at overall v/c ratios of 0.54 and 0.90 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound left-right, as it operates with v/c of 0.93 in the weekday afternoon peak hour.

Table 52 Whites Road / Highway 401 W-NS Off-Ramp – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBLR	0.76 (0.91)	D (C)	0.75 (0.88)	D (C)	0.75 (0.91)	D (C)	0.76 (0.91)	D (C)	0.76 (0.93)	D (C)
EBR	0.33 (0.78)	C (C)	0.31 (0.75)	C (C)	0.31 (0.74)	C (C)	0.33 (0.74)	C (C)	0.33 (0.74)	C (C)
NBT	0.43 (0.73)	B (C)	0.43 (0.83)	B (D)	0.43 (0.83)	B (D)	0.43 (0.84)	B (D)	0.44 (0.85)	B (D)
SBT	0.27 (0.47)	A (C)	0.28 (0.52)	A (C)	0.29 (0.53)	A (C)	0.30 (0.55)	A (C)	0.30 (0.56)	B (C)
Overall	**0.53 (0.83)**	**C (C)**	**0.52 (0.86)**	**C (C)**	**0.53 (0.88)**	**C (C)**	**0.53 (0.88)**	**C (C)**	**0.54 (0.90)**	**C (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings "E.X." = Existing, "F.B." = Future Background, and "F.T." = Future Total.

2039 Horizon Year

As per the submitted Terms of Reference and the Ministry of Transportation Ontario (MTO)'s Traffic Impact Study Guidelines, capacity analysis was also provided for the Whites Road / Highway 401 W-NS Off-Ramp intersection in the 2039 horizon year, summarized in **Table 53**. In future background conditions in the 2039 horizon year, the off-ramp operates at near capacity conditions at overall v/c ratios of 0.53 and 0.88 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound left-right, as it operates with v/c of 0.91 in the weekday afternoon peak hour. With the site redevelopment, the off-ramp will continue to operate at near capacity conditions at overall v/c ratios of 0.54 and 0.89 during the weekday morning and afternoon peak hours, respectively. Busy movements include the shared eastbound left-right, as it operates with v/c of 0.93 in the weekday afternoon peak hour.

Table 53 Whites Road / Highway 401 W-NS Off-Ramp – 2039 Horizon Capacity Analysis Results

Horizon:	2039	2039	2039	2039
Scenario:	Future Background	Future Background	Future Total	Future Total
Parameter:	V/C	LOS	V/C	LOS
EBLR	0.76 (0.91)	D (C)	0.76 (0.93)	D (C)
EBR	0.33 (0.74)	C (C)	0.33 (0.74)	C (C)
NBT	0.43 (0.84)	B (D)	0.44 (0.85)	B (D)
SBT	0.30 (0.55)	A (C)	0.30 (0.56)	B (C)
Overall	**0.53 (0.88)**	**C (C)**	**0.54 (0.89)**	**C (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

13.5 Unsignalized Intersections Analysis

The traffic analysis results of the unsignalized intersections (including the site access) is provided in **Table 54** and **Table 55**. Note that along Kingston Road, no left turns are permitted onto or from Kingston Road given the centre median BRT. Consequently, the Kingston Road / 715 & 775 Kingston Driveway / 780 Kingston Driveway operates with right-in / right-out control on either side of Kingston Road.

Under all future scenarios, all unsignalized intersections operate at acceptable levels-of-service and delays in the weekday peak hours at LOS C or better.

Table 54 Kingston Road / 715 & 775 Kingston Driveway / 780 Kingston Driveway – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	**E.X.**	**E.X.**	**F.B.**	**F.B.**	**F.T.**	**F.T.**	**F.B.**	**F.B.**	**F.T.**	**F.T.**
Parameter:	**LOS**	**Delays**	**LOS**	**Delays**	**LOS**	**Delays**	**LOS**	**Delays**	**LOS**	**Delays**
EBL	B (B)	12.4 (14.2)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBL	A (B)	9.2 (13.5)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
NBL	A (E)	0.0 (45.4)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
NBR	B (A)	10.0 (9.8)	B (B)	10.1 (10.6)	A (B)	9.7 (11.9)	B (B)	10.2 (10.7)	A (B)	9.7 (12.0)
SBL	D (E)	27.8 (38.1)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBR	B (B)	12.9 (14.4)	B (C)	13.5 (15.6)	B (C)	13.7 (16.1)	B (C)	14.0 (16.1)	B (C)	14.3 (16.5)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.
3. All delays are in seconds (s).

Table 55 North-South Road / 715 & 775 Kingston Driveway / Site Driveway – Capacity Analysis Results

Horizon:	2024	2024	2029	2029	2029	2029	2034	2034	2034	2034
Scenario:	E.X.	E.X.	F.B.	F.B.	F.T.	F.T.	F.B.	F.B.	F.T.	F.T.
Parameter:	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays	LOS	Delays
EBLTR	A (A)	7.6 (9.1)	A (A)	7.4 (8.8)	B (C)	12.2 (17.5)	A (A)	7.4 (8.8)	B (C)	11.9 (16.9)
WBLTR	A (A)	6.6 (7.6)	A (A)	6.5 (7.4)	A (A)	8.4 (9.3)	A (A)	6.5 (7.4)	A (A)	8.4 (9.3)
NBLTR	A (A)	7.6 (9.1)	A (A)	7.4 (8.7)	A (A)	0.0 (0.0)	A (A)	7.4 (8.7)	A (A)	0.0 (0.0)
SBL	A (A)	7.1 (7.5)	A (A)	7.0 (7.4)	A (A)	7.3 (7.6)	A (A)	7.0 (7.4)	A (A)	7.3 (7.6)
SBTR	A (A)	6.2 (7.6)	A (A)	6.0 (7.3)	A (A)	0.0 (0.0)	A (A)	6.0 (7.3)	A (A)	0.0 (0.0)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The table headings “E.X.” = Existing, “F.B.” = Future Background, and “F.T.” = Future Total.
3. All delays are in seconds (s).

13.6 Traffic Operations Analysis Summary

The study area road network is expected to operate increasingly busy conditions in all future horizon years, especially in the weekday afternoon peak hour. However, most of the analyzed intersections and their movements operate under capacity and at acceptable delays. As the area's transportation context continues to evolve with the completion of the Kingston Road BRT, residents and visitors to and from the site and in the general community will be afforded with viable alternatives to travel without the use of single-occupancy vehicles during weekday peak hours.

Based on the foregoing analysis and the nature of the future area context, it is reasonable to suggest that no mitigation measures nor improvements are required aside from signal timing changes at intersections along Kingston Road to better serve vehicle travel demand alongside the centre median BRT.

14.0 SUMMARY AND CONCLUSIONS

The following outlines the key transportation study findings for the proposed development.

Introduction

1. BA Group has been retained by Resident to provide transportation advisory services in relation to a proposed redevelopment of the lands located at 705 Kingston Road in the City of Pickering and Region of Durham. This report has been prepared as part of an initial ZBA application being made to the City and Region.

Existing Site

2. The site is currently occupied by the Whites Road Shopping Centre, comprising two single-storey buildings. The larger building is an “L-shaped” structure operated by various commercial tenants located in the southwest of the property. The smaller building fronts onto Kingston Road and is operated as a food establishment. There are approximately 309 surface parking spaces provided to support the existing buildings. Existing loading facilities are visible to the rear (southern boundary) of the larger building.

3. Vehicle access to the property is currently provided by two driveways located to the east and west of the site. The west driveway includes a right-in only slip lane providing access for eastbound traffic along Kingston Road. The east driveway provides an all-moves access from a north-south private road (across from Delta Boulevard) off Kingston Road that is shared with the neighbouring automobile dealership to the east of the site. The intersection of Kingston Road and the north-south private road / Delta Boulevard is currently signalized.

4. The site is currently subject to the as-of-right permissions and transportation standards per City of Pickering Zoning By-law 3036 (as amended).

Development Proposal

5. The development proposal includes a mixed-use development with five building towers comprising 1,748 residential units and 3,922 m^2 of retail GFA.

6. It is proposed to demolish the existing buildings and majority of surface parking as part of the proposed development. In addition, the existing eastern access will be maintained while the right-in only slip lane along Kingston Road will be removed. The existing north-south private road will also be proposed as a public road to conform to the OP.

Planning and Policy Context

7. The site is subject to several provincial, regional, and municipal policies and plans relevant to the site from a transportation context. Overall, these documents indicate support for increasing development near existing and future transit corridors, prioritizing transit and active transportation to reduce single-occupant vehicle travel and applying TDM measures to encourage travel through sustainable modes.

8. The Region and City recognize Kingston Road and Whites Road as key corridors or “main streets” (in the case of Kingston Road), expected to deliver future rapid transit, cycling infrastructure, and a mix of uses.

9. OPA 38 incorporates the policies and schedules of the Kingston Mixed Corridor and Brock Mixed Node Intensification Plan and Draft Urban Design Guidelines, which guides intensification and redevelopment along the Kingston Road corridor as a walkable, transit supportive corridor with a high-density mix of uses. The site is in the White Precinct and is required to provide a new north-south public road immediately to the east of the site. Following Regional Council approval, OPA 38 is currently under appeal at the OLT.

Area Transportation Context

10. The site is well-located relative to major roadways connections provided across the City and the Region, including Highway 401, Kingston Road, and Whites Road. Notably, the public ROW of Delta Boulevard is proposed to extend south from Kingston Road to its terminus as a cul-de-sac, adjacent to the site, known as the north-south public read. Roadway widenings along Kingston Road and Whites Road are also expected to accommodate bus and HOV lanes.

11. A shared bus stop, providing transit service via DRT, DRT Pulse Express, and GO Transit is located on Kingston Road at Whites Road, abutting the site's northern property line. These services provide direction connections to key transit destinations including the Pickering Town Centre (Pickering Parkway Terminal) and the Pickering GO Station. In the future, the site's transit connectivity will significantly improve as a result of the planned DSBRT that will extend from Scarborough Centre to Downtown Oshawa and the Metrolinx GO Expansion project that will improve travel times, increase frequency, and expand rail lines.

12. It is noted that the proposed design of the DSBRT provides exclusive bus lanes along Kingston Road at the location of the site, which presents a significant opportunity to build a truly transit-oriented developments with high density and mixed-uses. This type of development and transit accessible location is an appropriate setting to provide reduced parking at the site.

13. The site is centrally located along the Kingston Road corridor, just outside of the City Centre. There are a mix of uses along this corridor that can be accessed by walking, however, the vehicle-oriented design of the area (i.e. large surface parking lots, wide streets, lack of mid-block crossings) does not prioritize pedestrian travel. Sidewalks and pedestrian crossings are provided on all major roadways and at all major intersections near the site, including Kingston Road and Whites Road. Improvements to the pedestrian realm and infrastructure are proposed in the area along Kingston Road and the new north-south public road, as subject to the site.

14. Near the site, bike lanes are currently only provided along a portion of Kingston Road. Future plans for cycling in the Region include extending cycling infrastructure along Kingston Road and along other nearby roadways including Whites Road, Bayly Street, and Sheppard Avenue.

Vehicle Parking

15. The site is primarily subject to the City of Pickering Zoning By-law 3036 vehicle parking standards, as amended by site-specific zoning by-law 2324/86. Application of the subject vehicle parking requirements results in a minimum of 3,270 vehicular parking spaces including 3,059 combined resident and residential visitor parking spaces and 211 retail parking spaces.

16. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. Application of the City of Pickering Comprehensive Zoning By-law for "All Other Zones" results in a total requirement of 2,780 vehicle parking spaces, inclusive of 2,185 resident parking spaces and 595 shared non-resident parking spaces. This total is representative of the weekday evening period which yields the highest time of day parking requirement across both weekdays and weekends.

17. It is proposed to reduce the minimum vehicle parking standards of the site, including a resident rate of 0.65 spaces per unit and shared non-resident rate of 0.20 spaces per unit. Application of the proposed minimum parking standards results in a requirement of 1,485 spaces, including 1,136 resident spaces and 349 spaces. As specified in the Draft Site-specific Zoning By-law, the minimum shared non-resident parking rate applies to the residential visitor, day care centre, financial institution, food s tore, personal service shop, retail store, restaurant, medical office, and temporary sales office uses.

18. The architectural plans illustrate a total vehicular parking supply of 1,488 parking spaces, including 1,138 resident spaces (approximately 0.65 spaces per unit) and 350 non-resident spaces (approximately 0.20 spaces per unit) to support the site. The vehicular parking spaces will be located on the P1, B2, B1, Ground Floor, and Podium Levels 2, 3, and 4 of the proposed development. Access to the vehicular parking spaces will be provided via two (2) parking ramps which can both be accessed from the proposed site driveway off the north-south public road. Also, EV (i.e., EV rough-in and EV ready) parking spaces are provided in accordance with the City's ISDS.

19. Accessible parking is required in accordance with the City of Pickering Traffic and Parking By-law 6604/05, as amended, which calculates the required number of accessible parking spaces based on the proposed non-resident parking supply. Based on the non-resident parking supply, a total of 9 accessible parking spaces, consisting of 4 Type A and 5 Type B spaces, are required. The current proposal incorporates a total of 19 accessible parking spaces, including 9 non-resident accessible spaces and 10 resident accessible spaces, which are located near the parking elevator lobbies on multiple parking levels.

20. It is recognized that the in-force minimum parking requirements of the City of Pickering Zoning By-law 3036 and the contemporary City of Pickering Draft Comprehensive Zoning By-law standards overstate the parking needs of contemporary developments in transit-accessible areas of Pickering. The proposed parking standards for the site are appropriate based on the following:

    - Policy and transportation context (e.g., rapidly evolving transit and active transportation facilities) applicable to the site;
    - Review of supportive parking demand, approvals, and sales data, indicating declining parking needs over time;
    - Nature of proposed retail uses;
    - Shared non-residential parking permissions adopted by the City of Pickering; and
    - Additional support from the site's proposed TDM strategy to reduce single-occupancy vehicle travel for all uses.

21. The proposed vehicle parking supply is considered appropriate and is expected to meet the anticipated resident, visitor, and non-residential needs of the site.

Bicycle Parking

22. The site is primarily subject to City of Pickering Zoning By-law 3036 (as amended) which does not specify minimum bicycle parking requirements.

23. The City of Pickering Draft Comprehensive Zoning By-law provides city-wide bicycle parking standards that are consistent with the latest bicycle parking standards in the City's Integrated Sustainable Design Standards for Tier 1. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, the latest city-wide standards are currently being considered for the proposed development. Application of Draft Comprehensive Zoning By-law and Integrated Sustainable Development Guidelines (Tier 1) standards to the proposed development results in a minimum bicycle parking requirement of 878 spaces for the long-term use and 174 spaces and 1 bicycle parking rack for the short-term use. As part of this requirement, a minimum of 15% long-term resident bicycle spaces are to be designated as electric.

24. The architectural plans illustrate a supply of 1,056 bicycle parking spaces, including 880 long-term spaces and 176 short-term spaces. The long-term resident bicycle parking is provided on Levels B1 and P1, which may be accessed from the building elevators located at-grade. The short-term resident bicycle parking is provided on Level B2 and may be accessed from publicly accessible building entrances / elevators and the external network. All retail bicycle parking is provided on Level B2. Also, 15% of the required long-term resident bicycle spaces are designated as electric.

25. The proposed bicycle parking supply exceeds the minimum recommended requirements and provides ample opportunities for future cyclists of the site.

Loading

26. The site is primarily subject to the City of Pickering Zoning By-law 3036 (as amended) loading standards, which result in no minimum requirement.

27. The City of Pickering Draft Comprehensive Zoning By-law provides city-wide loading standards. Although the site is not included in the Draft Comprehensive Zoning By-law and is to be further reviewed throughout the zoning process following OPA 38, for comparison purposes, there are no minimum requirements for the proposed development. However, City of Pickering Draft Zoning By-law Section 5.14.1 states that loading activity shall be provided and maintained on the same lot of the principal use. The minimum vertical clearance shall be 7.0 metres for garbage collection vehicles, as governed by Durham Region Waste Collection By-law 46-2011. It is proposed to adopt the minimum dimensions stated by the City of Pickering.

28. Since the City's Draft Comprehensive Zoning By-law currently does not indicate any specific minimum loading requirements, it is appropriate to consider the practical needs of the site based upon a review of a nearby municipality with progressive loading standards within an urban context. Application of the City of Toronto Comprehensive Zoning By-law standards (after adopting all applicable shared loading clauses) results in a minimum loading requirement of 4 Type G spaces (used for waste / garbage collection purposes) and 1 Type C space (used for residential moving purposes). As a practical and conservative approach, it is proposed to adopt the minimum number of spaces required by the City of Toronto.

29. The architectural plans illustrate a loading supply of 5 loading spaces, including 4 loading spaces for residential waste collection / retail purposes for all buildings and 1 additional loading space for residential moving activity to support the substantial number of units in Buildings 4 and 5. In reference to City of Toronto's Waste Management Guidelines, appropriate bin staging areas are proposed at the loading facilities of the buildings.

30. The proposed loading supply meets the recommended minimum requirements and provides a practical strategy for the buildings of the site.

Pick-up / Drop-off

31. While not required by the Zoning By-law, passenger pick-up / drop-off facilities are proposed on the site in the form of a highly visible pick-up / drop-off loop and short-term parking spaces located at-grade near all the new buildings. The short-term spaces are distributed directly across the main building entrances of Buildings 1, 2, and 3 while the pick-up / drop-off loop is located between Buildings 4 and 5. The facilities can support a total accumulation of 14 vehicles.

32. The proposed pick-up / drop-off facilities are expected to serve as a convenient short-term parking strategy for day-to-day activities (i.e., pizza delivery, passenger pick-up / drop-off, ride-sharing services).

33. While not formally required from a Zoning By-law perspective, it is anticipated that the proposed pick-up / drop-off facilities will benefit future residents, visitors, and employees and meet the practical needs of the site while limiting vehicular impacts on the area road network.

Transportation Demand Management

34. Based upon the Durham Region's Traffic Impact Study Guidelines and Draft TDM Guidelines for New Development (2021), a TDM Plan is required to support the proposed development.

35. Specific TDM strategies proposed include, but are not limited to, the following:

    - Provide a reduced vehicle parking supply;
    - Provide pick-up / drop-off facilities on-site to encourage ride-sharing activities;
    - Provide bicycle parking that exceeds the minimum as-of-right Zoning By-law requirements (i.e., meets City of Pickering Draft Comprehensive Zoning By-law);
    - Provide enhanced sidewalk connections along Kingston Road and on-site for convenient travel to transit stops and various services / amenities; and
    - Provide a mixed-use transit-oriented development with various nearby and on-site services and amenities.

36. It is noted that the strategies are to be further refined and discussed with the City and Region throughout the ZBA and SPA processes.

Functional Road Plan

37. To assist in the development of the functional road plan at the site, Metrolinx has provided a high-level concept plan for the design of the DSBRT between Whites Road and Delta Boulevard, as an interim output from its ongoing process (i.e., TPAP approved 30% preliminary design in 2022). As such, the ultimate functional design of Kingston Road (i.e. 45-metre ROW) at the site was prepared for discussion purposes only with the City and Region.

38. As mentioned, it is proposed to provide a north-south public road with a maintained pavement width of approximately 17.35 metres. The proposed public road will extend directly south of Delta Boulevard, between Kingston Road in the north to its southern terminus as a cul-de-sac in the south, adjacent to the proposed on-site urban park. The interim and ultimate (approximately 27.35-metre ROW) functional design of the new public road were prepared for discussion purposes only with the City.

39. Two site accesses are proposed at the southern terminus (i.e., cul-de-sac) of the new north-south public road and will operate as an all-moves, unsignalized (STOP-control) intersection. The site access is located approximately 75 metres south of the Kingston Road and north-south public road intersection (centreline-to-centreline distance) and will serve all site traffic activity. The design of the site access provides appropriate curb radii (i.e., minimum of 6 metres) and driveway width (i.e., minimum of 6 metres) based on City of Pickering Standard Drawing P-605 (Medium to High Density Residential, Commercial, and Industrial Driveway Access), dated July 2019.

40. In the interim condition of the north-south public road, it is proposed to provide a reduced cul-de-sac radius of 10 metres. The reduced cul-de-sac size is considered appropriate based on a review of manoeuvres for anticipated public servicing vehicles that can comfortably ingress and egress the proposed cul-de-sac area. In the ultimate condition, the cul-de-sac radius meets the City's design standard of 13 metres for typical residential uses.

Multi-modal Travel Demand Forecasting

41. The site is expected to generate 885 and 1,070 two-way gross person trips during the weekday morning and afternoon peak hours, respectively.

42. Of the total two-way trips, the site is expected to generate 20 and 110 internal trips during the weekday morning and afternoon peak hours, respectively. These internal trips occur within the site development and do not cause any traffic-related impacts to the surrounding area road network.

43. The site is also expected to generate 865 and 960 new external trips during the weekday morning and afternoon peak hours, respectively. Of this total, 775 and 730 trips are external residential trips, while 90 and 230 trips are external retail trips.

Traffic Volume Forecasting

44. Turning movement counts (TMC) were conducted by Spectrum Traffic Inc. on behalf of BA Group for the study area intersections in May of 2024. The counts were completed during the weekday morning and afternoon peak periods (the busiest hours of traffic on weekdays are generally between 7:00 a.m. to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.).

45. Based on discussions with the City of Pickering, Region of Durham and Ministry of Transportation Ontario, the analysis horizons presented in this report include the 2029 year (buildout year that is 5 years from today) and 2034 year (10 years from today) for all study area intersections. Based on the MTO's Traffic Impact Study Guidelines, analysis will also be provided for the Highway 401 ramps up to the 2039 year (15 years from today).

46. A total of thirteen (13) development proposals are expected to be built out, including almost 23,000 residential units and 50,000 m^2 non-residential GFA.

47. The background development volumes considered on the study area road network would represent a substantial amount of corridor and ramp growth even to the furthest 2039 horizon year if considered relative to baseline existing traffic volumes. Based on the foregoing, no additional corridor growth was added.

48. For the purposes of all future conditions analysis, recognizing the increasing attractiveness of the transit travel mode as the area continues to develop, existing Kingston Road corridor volumes are reduced by 10% in each horizon year.

49. Other background growth traffic volumes were not further adjusted given that a majority of the traffic studies already incorporate a similar reduction in their respective trip generation forecasts.

50. Other potential changes to pre-existing network volumes and background development traffic assignments in the study area have been considered based upon:

    - Changes to intersection configurations along the Kingston Road corridor to accommodate the BRT, including the prohibition of turns onto Kingston Road at unsignalized intersections as a result of the BRT median. This also includes the addition of U-turns at proximate signalized intersections to compensate for the loss of left turns.

    - Signal timings have also been revised to include fully protected left turns instead of protected and permitted left turns. North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) have also been increased where the width of the intersection has increased.

    - Existing capacity constraints at the Kingston Road / Whites Road intersection especially in the weekday afternoon peak hour, resulting in vehicle trips diverting away from the Whites Road / Highway 401 Ramps to continue westward along Kingston Road.

51. The existing site generates approximately 55 and 220 two-way vehicle trips in the weekday morning and afternoon peak hours, respectively. With the redevelopment, the existing site traffic volumes will be removed from the study area road network and replaced with the new site traffic volumes.

52. In the 2029 horizon year, the site will generate 480 and 555 auto driver trips in the peak hours. In the 2034 horizon year, the site will generate 460 and 535 auto driver trips in the peak hours. In the 2039 horizon year, the site will generate 435 and 505 auto driver trips in the peak hours. The vehicle trips summarized above will be analyzed on the study area road network. The declining site trips in the further horizon years represents the site's increasing use of the transit travel mode, as interpolated from the DSBRT Study mode split forecasts for the 2041 year.

53. For comparison purposes relative to existing conditions, in the 2029 horizon, the site will generate 425 and 405 additional vehicle trips during the weekday morning and afternoon peak hours, respectively. By the 2034 horizon, the site will generate 405 and 385 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. By the 2039 horizon, the site will generate 380 and 355 additional vehicle trips during the weekday morning and afternoon peak hours, respectively, relative to existing conditions. The declining net new trips in the further horizon years represents the site's increasing use of the transit travel mode, applying mode split forecasts from the DSBRT Study.

Traffic Operations Analysis

54. Under future conditions with the BRT in operations, the following revisions have been made to the signal timing plans at intersections along Kingston Road:

    - Coded fully protected left turns instead of protected and permitted left turns.
    - North-south pedestrian crossing times (including "walk" and "flash-don't-walk" times) as well as intergreen times (i.e., amber and all-red) have been increased where the width of the intersection has increased.
    - Increased cycle lengths to 140 seconds (instead of the current 120 seconds) at all signalized intersections along Kingston Road to account for the increased intergreen times and pedestrian crossing times. Cycle lengths at intersections of a similar context (such as at intersections along Highway 7 in the City of Markham with VIVA bus rapid transit) are up to 150 seconds.
    - Revise the recall mode at study area intersections from Coordinated Maximum (C-Max) to Coordinated Minimum (C-Min), and those coded as Maximum (Max) to Minimum (Min). This provides flexibility to each signal phase from its minimum split time, rather than forcing maximum splits along both the east-west and north-south travel directions at the study area intersections (which would effectively act as fixed timing). From observing the signal timings in the field, it appears as though signal timings are operating under coordinated minimum and minimum times, given that there is fluctuation in split times at the study area's signalized intersections. However, the received Synchro model signal timings provided by the Region all code C-Max and Max recall modes. This does not seem to reflect field conditions.

55. The Kingston Road / Whites Road intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2034, even with the site redevelopment.

56. The Kingston Road / Delta Boulevard intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2034, even with the site redevelopment.

57. The Kingston Road / Highway 401 E-EW Off-Ramp intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2034, even with the site redevelopment. The off-ramp movements operate under capacity at v/c of up to 0.89 in the peak hours. In the MTO's horizon year of 2039, the off-ramp movements continue to operate under capacity at v/c of up to 0.89, but the eastbound through movement operates at v/c of 1.01 while the westbound left turn operates at 0.94. Notwithstanding these future conditions, no further mitigation measures are recommended at this time. It is noteworthy that the capacity constraints only occur during the weekday afternoon peak hour, while morning peak hours yield acceptable operations. The eastbound right turn volumes are also relatively low (up to 30-45 vehicles per peak hour, less than 1 vehicle per minute). Given such low volumes, it would not be reasonable to propose any additional intersection improvements (such as an additional eastbound right turn lane, especially since that increases conflicts with pedestrians and cyclists in the study area). Traffic operations in the study area should be monitored especially as the impacts of the Kingston BRT are more fully realized. Should the need arise, other opportunities to enter Highway 401 are provided either along Whites Road (those on-ramps are free-flow) or further westwards. Site-related impacts on the shared eastbound through-right are minimal (in the order of 3%) in the weekday afternoon peak hour.

58. The Whites Road / Highway 401 W-NS Off-Ramp intersection is expected to operate at busy but under capacity conditions through to the furthest horizon year of 2034, even with the site redevelopment. The off-ramp movements operate under capacity at v/c of up to 0.93 in the peak hours. In the MTO's horizon year of 2039, the off-ramp movements continue to operate under capacity at v/c of up to 0.93.

59. Under all future scenarios, all unsignalized intersections operate at acceptable levels-of-service and delays in the weekday peak hours at LOS C or better.

60. The study area road network is expected to operate increasingly busy conditions in all future horizon years, especially in the weekday afternoon peak hour. However, most of the analyzed intersections and their movements operate under capacity and at acceptable delays. As the area's transportation context continues to evolve with the completion of the Kingston Road BRT, residents and visitors to and from the site and in the general community will be afforded with viable alternatives to travel without the use of single-occupancy vehicles during weekday peak hours.

Overall

61. Based on a comprehensive review of requirements, applicable standards, and provisions (and any associated justifications), all transportation-related elements (i.e., vehicle parking, bicycle parking, loading, pick-up / drop-off, TDM Plan, and functional road plan) of the development plan remain appropriate and are anticipated to meet the future needs of the site.

62. No mitigation measures nor improvements are required on the external area road network aside from signal timing changes at intersections along Kingston Road to better serve vehicle travel demand alongside the future DSBRT.

Appendix A:
Pre-Consultation Meeting Comments

Minutes/Meeting Summary

Pre-Consultation Meeting
November 29, 2023
11:00 pm
Microsoft Teams Meeting

Subject: 705 Kingston Road (PRE 039/23)

Owner: Plaza Partners

Attendees: Mallory Nievas, The Biglieri Group
Nik Papapetrou, Plaza Partners
Ornella Richichi, Plaza Partners
Tom Bosnjak, Plaza Partners
Steven Kwan, BA Group

Alexander Hajjar, Senior Project Manager, Ministry of Transportation (MTO

Paal Helgesen, Division Head, Water Resources & Development Services
Nilesh Surti, Division Head, Development Review & Urban Design
Robert Watson, Fire Prevention Officer, Fire Services
Arnold Mostert, Manager, Landscape & Parks Development
Amanda Dunn, Principal Planner, Development Review
Paul Wirch, Principal Planner, Policy
Irina Marouchko, Senior Water Resources Engineer
Nadeem Zahoor, Transportation Engineer
Laura Calvelli, Project Manager, Development Approvals
Paula Viola, Senior Zoning Examiner

Distribution: Vannitha Chanthavong, Region of Durham Planning Department
Peter Castellan, Region of Durham Works Department
Stephanie Dore, Toronto and Region Conservation Authority
Durham Regional Police Radio Systems – Communications
Canadian Pacific Railway
Trans-Northern Pipelines Inc.

Peter Furnell, Supervisor, Building Permits
Jill McMullen, Supervisor, Geomatics
Bahar Ebrahimi, Senior Zoning Examiner
Lalita Paray, Senior Planner, Sustainability

<table>
<tr><th>Item</th><th>Details, Discussion & Conclusion
(summary of discussion)</th></tr>
<tr><td>Proposal</td><td>

The subject lands have a total area of approximately 2.7 hectares with approximately 178 metres of frontage along Kingston Road. The lands are currently occupied by numerous retail/commercial tenants consisting of various fast-food restaurants, retail stores, banks and associated parking;
The applicant is proposing to redevelop the subject lands to accommodate a two phased development which will consist of three buildings and three towers ranging in height from 12 to 35 storeys. A total of 1,770 residential units are proposed; and
The development proposal consists of a total Floor Space Index (FSI) of 4.5. The development proposal also provides 2,773 square metres for retail/commercial space at grade. A total of 1,575 residential parking spaces are proposed to support the proposed development along with 134 commercial parking spaces.
The pertinent development statics for the two phases include:

Phase 1: is located on the northern portion of the site and is proposed to be comprised of three residential buildings with ground-related retail/commercial uses. The building on the most northwestern portion of the site is proposed to be 35-storeys which is connected to a 12-storey mid-rise building which fronts onto Kingston Road. A second 12-storey building is proposed to front onto Kingston Road. A total of 710 units are proposed with a total of 2,160 square metres of commercial/retail floor space.
Phase 2: is located on the southern portion of the site and is proposed to consist of three high-rise towers proposed at 35 storeys each. A total of 1,060 units are proposed with 613 square metres of commercial/retail floor space. The three towers are proposed to be connected by a four-storey podium that will contain parking and residential units. The roof of the proposed podium will include a green roof and amenity space. In addition, 500 square metres of shared outdoor amenity space is proposed to consist of a connected 1,160 square metres terraced POPS space, which is accessible from the private road.

</td></tr>
<tr><td>Type of Applications</td><td>

Official Plan Amendment (major);
Zoning By-law Amendment (major); and,
A separate pre-consultation will be required for a future Site Plan application.
</td></tr>
</table>

<table>
<tr><th>Item</th><th>Details, Discussion & Conclusion
(summary of discussion)</th></tr>
<tr><td>New Pre-Submission Process</td><td>In response to changes to the Planning Act brought in by Bill 109, the City of Pickering has made pro-active changes to the development review process.

Following the pre-consultation meeting, Proponents will submit all required materials as part of a pre-submission package to the City. During the pre-submission stage, staff will circulate the reports and drawings to all agencies and departments for technical review. More detailed information, such as peer reviews, will also be required at this stage.

The pre-submission stage will be an iterative process, where City Departments and external agencies will provide technical comments on submitted materials, and the Proponent can address key technical issues and revise their submission materials as needed.

The revised submission materials may then be submitted as part of complete applications for Official Plan Amendment and Zoning By-law Amendment.

The pre-submission stage also requires consultation with the public through a mandatory open house, hosted jointly by the Proponent and the City. The comments received from the open house must be provided in a public engagement report as part of a complete application.</td></tr>
<tr><td>Renny Boodoo, Durham Regional Police, Radio Systems – Communications

(via email)</td><td>Construction on the subject property will post no immediate obstruction issue for the Region’s NextGen radio system and associated microwave links; and,
Internal in-building radio coverage for first responders may be an issue in the future for large buildings. Larger and newly constructed buildings will have to be tested for in-building coverage once the buildings are completed.</td></tr>
<tr><td>Alexander Hajjar, Ministry of Transportation</td><td>Please accept these comments as “preliminary”, as the ministry reserves the right to provide formal comments, once the full-size plans and required reports are submitted for our review.

General Site Plan comments:
The subject site is within MTO’s Permit Control Area and as such, MTO Site Plan Approval and an MTO Building and Land Use Permit will be required prior to any construction activities on the site;
A 14-metre minimum setback is required from the Highway 401 and associated service roads property line. The current right-of-way (ROW) as well as a 14 metre MTO setback should be clearly labeled on all drawings that will be provided for the ministry’s review and comments;</td></tr>
</table>

Item	**Details, Discussion & Conclusion** (summary of discussion)

	• Please be aware that no feature, amenity, or operational arrangement (such as, but not limited to, fire-routes, emergency access/exits, parking, loading docks, access to loading docks, storm-water management ponds) that is required by the by-law or is essential to the viability of this site, should be located within the setbacks. Furthermore, only the surplus parking (excess of the Municipality's minimum parking requirement under the Zoning By-law) can be located within the 14 metre MTO setback, but must be setback a minimum of 3 metres from the Highway 401 property line. All required and surplus parking must be clearly indicated on the Site Plan;
	
	• Requirements for fencing include (but are not limited to) erecting fencing along the MTO right-of-way at 0.3 metre into the MTO ROW. An MTO Encroachment permit is required for this work and it should follow OPSD 972.130 (Chain Link Fence with Top-Wire);
	
	• As part of the review and approval process the applicant will be required to submit copies of a detailed **Site Plan, Master Storm Water Management Report, Site Servicing, and Grading Plans** prepared by a Licensed Professional Engineer;
	
	• Please have the proponent confirm the reports have been carried out by RAQs approved contractors/consultants. All works within the Provincial right-of-way shall be carried out by RAQs qualified contractors;
	
	• MTO requires a **Brief/Letter** from the Traffic Consultant to describe the general criteria of the anticipated traffic;
	
	Please be aware that MTO has the right to request a more detailed (Master) Traffic Impact Study should the brief/letter be deemed insufficient upon review.
	
	• All works within the Provincial right-of-way shall be carried out by RAQS qualified contractors;
	
	• Please note that the Ministry requires all drainage submissions to be provided electronically. Regarding acceptable electronic transfer of files to MTO, the following applies:
	    • Format: **PDF**; and,
	    • Currently electronic files can be sent in using an **FTP (File Transfer Protocol) website**.
	
	• Using **email**, if the file is small enough, it can be emailed (zipped documents are acceptable);

Item	**Details, Discussion & Conclusion** (summary of discussion)
	• Any noise mitigation is the responsibility of the land-owner which includes the design and implementation. The Ministry will not be held liable for noise attenuation next to the highway which also includes its maintenance and upkeep; • The proponent is required to submit a copy of the **Photometric Lighting Plan** (in metric LUX units) for MTO's review and approval. The plan must illustrate proposed lighting and any light spillage on the Highway 401 and associated service roads ROW; • All plans and reports must be stamped, signed and circulated to the MTO through municipal site plan application process for a formal review and comments; • The Applicant should be advised that they cannot apply for the MTO Permit until the Site Plan has been approved by MTO and the Municipality; • MTO Sign Permits will be required for any new signage visible from Highway 401 and associated service roads. The Applicant is advised they must apply online through the link below once a clearance letter is issued: https://www.hcms.mto.gov.on.ca/; • The applicant is advised that all plans and reports must be stamped and signed; and, • Further information regarding requirements for our Building and Land Use Permit Applications, and Sign Permit Application requirements is also available from our office by contacting Arieh Kolet, the Corridor Management Officer for this area; he can be reached at (416) 833-9487 or Arieh.Kolet@ontario.ca. This website has resources for the requested reports: Highway corridor management (gov.on.ca).
Vannitha Chanthavong, Planning and Economic Development, Region of Durham (via email)	**Region of Durham Official Plan (ROP):** The subject lands are designated as "Living Areas" in the Regional Official Plan (ROP). Living Areas are intended to be developed to include a mix of housing types, sizes, and tenure to meet the diverse housing needs of the residents of the Region Durham. Kingston Road and Whites Road are designated as "Regional Corridors" and Kingston Road is recognized as a "Transit Priority Network" in the ROP. Development proposals along Regional Corridors should be at higher densities and support a density target of at least 60 residential units per gross hectare (upgh) and a floor space index of 2.5. The built form should include a variety of mid-rises with some higher buildings, as detailed in area municipal Official Plans.

Item	Details, Discussion & Conclusion (summary of discussion)
	Region of Durham, Adopted Official Plan On May 17, 2023, Regional Council adopted the new Regional Official Plan. The newly adopted ROP is currently with the Ministry of Municipal Affairs and Housing for approval. The proposed development has been reviewed for conformity with the new ROP. The subject site is designated as “Community Areas” on Map 1 – Regional Structure in the new ROP. Community Areas are intended for a variety of housing types, sizes and tenures within connected neighbourhoods that include population-serving uses such as commercial, retail (including major retail), personal service uses, home businesses, recreational uses, public service facilities, institutional uses and office uses, provided such uses are appropriately located and compatible with their surroundings. Whites Road is designated as a Regional Corridor and Kingston Road is designated as a Rapid Transit Corridor on Map 3a – Transit Priority Network in the new ROP. Transit Corridors are identified as Strategic Growth Ares where emphasis is on accommodating intensification and higher-density mixed uses in a compact urban-built form. Kingston Road and Whites Road are recognized as Rapid Transit Spines on Map 3a- Transit. Rapid Transit Spines provide key connections to other Strategic Growth Areas within the Region, where development is provided at transit supportive densities and new built form is provided based on transit-oriented development design principles. Rapid Transit Spines should accommodate 160 people and jobs per hectare (72 uph). The residential density of the proposed mixed-use development is approximately 656 units per hectare (uph) and conforms with the Region’s density target for Rapid Transit Spines. The proposed residential development supports a mix of housing options for the residents of Durham Region. The proposed high density and commercial uses supports mixed-use developments, compact built-form, provides transit-supportive densities, and promotes the intensification of the Kingston Road and Whites Road Corridors. The proposed development conforms with the current ROP and the newly adopted ROP. The ROP also includes implementation policies pertaining to the use and lifting of Holding symbols. Section 14.5.3 indicates that prior to passing a by-law to remove the holding symbol, the Council of the area municipality shall ensure that:

Item	Details, Discussion & Conclusion (summary of discussion)
	"*The owner has satisfied all the requirements of the Regional Municipality of Durham with respect to the provision of sewer and water services, Regional roads, and entered into any necessary agreements in this regard".* The Region has no objection to the proposed development subject to the inclusion of an appropriate Holding (H) Symbol on the subject lands to demonstrate through a future site servicing agreement that there is sufficient servicing capacity to enable the full development of the site as proposed by the Zoning By-law amendment to the satisfaction of the Region. **Delegated Provincial Plan Review Responsibilities** The Region has completed the screening of the subject site for delegated Provincial Plan review responsibilities: • **Record of Site Condition:** The subject lands currently support existing commercial uses. In accordance with Durham Region's Soil and Groundwater Assessment Protocol, the proposed prescribed change in use of a commercial property to residential will require a Record of Site Condition to be filed with the Ministry of the Environment, Conservation and Parks for the subject lands. • **Noise and Vibration Impact Study:** The proposed residential development is located in proximity to Kingston Road, Whites Road, Highway 401, and the Canadian National Railway corridor. A "Noise and Vibration Impact Study" prepared by a qualified acoustic consultant is required to support the proposed development. The Noise and Vibration Impact Study must be prepared based on the Region's forecasted traffic data. The noise consultant will be required to contact the Region to obtain the traffic data for the noise study by emailing: noiserequests@durham.ca. STAMSON Model must be used to prepare the noise study. The applicant must include the recommended noise control measures of the study in the related City of Pickering's Site Plan/Development Agreement to the satisfaction of the Region of Durham. **Regional Servicing, Transportation, and Durham Regional Transit** Comments related to Regional Servicing, Transportation and Transit will be provided by the respective review agencies.

Item	Details, Discussion & Conclusion (summary of discussion)
	Regional Development Review Fees and Application Requirements • Area Municipal Official Plan Amendment (AMOPA) review fee of $3,500.00 is required; • Draft Plan of Subdivision review fee of $5,000.00 is required (if applicable); and, • The Rezoning review fee is waived if the application is submitted concurrently with the AMOPA application. The Region does not collect a review for Site Plan applications.
Region of Durham, Works Department	Detailed comments have not yet been received from the Region of Durham, Works Department, and will follow in separate cover once received. The Region has verbally identified to staff that the following items are required to be submitted: • **Traffic Impact Study;** • **Functional Servicing Report;** and, • **Waste Management Report.**
Laura Calvelli, Project Manager, Development Approvals	The following is required: 1. **Functional Servicing and Stormwater Management Report (FSSR) must be submitted which includes the following:** a. **Functional Site Grading Plan** – all elevations are to be referred to a City of Pickering benchmark; b. **Functional Site Servicing Plan**; and c. **Erosion & Sediment Control –** This section should also describe construction management for each phase of construction, particularly because this site will be a phased development with existing commercial activity. 2. **Site Plan –** must clearly show exterior site components and driveway access design with appropriate dimensions; 3. **Geotechnical report;** and, 4. **Hydrogeological report –** shall address long term ground settlement. The applicant should be aware that long term permanent discharge of foundation drainage containing groundwater shall not be permitted to discharge to a City storm sewer. A completely below grade structure, resistant to hydrostatic pressure, is required.

Item	Details, Discussion & Conclusion (summary of discussion)
	The applicant is advised that should the north-south road be public, it is to be constructed to City of Pickering standards. The proponent should contact Engineering Services prior to the submission to discuss right-of-way widths and any turning circle requirements.
Rob Watson, Fire Prevention Officer	• The fire route, principal entrances and fire hydrant's locations should be illustrated on the conceptual site plan; and, • Include a Building Code Matrix for each proposed building.
Irina Marouchko, Senior Water Resources Engineer	A **Stormwater Management Report** is required. The following is the SWM criteria for the subject lands: • Quantity control: control of post-development peak flow rates to pre-development levels for all storm events up to the 100-year return period. A maximum runoff coefficient of 0.5 shall be used to represent pre-development conditions; • Quality control: Enhanced water quality protection (80% TSS Removal); and, • Erosion control: minimum 5mm retention/infiltration the on-site. Low Impact Development (LID) measures shall be designed in accordance with the TRCA & CVC LID SWM Planning & Design Guide and the City's SWM Design Guidelines.
Justine Woulfe, Geomatics	At the time of submission, the City requires the proponent to submit georeferenced drawings defining a geographic coordinate system of: **NAD83 UTM Zone 17N**. These drawings, in relation to the by-law are to be passed and the site plan and the final 40M or 40R plan, should be in a format that is compatible with or the same as the following: • **ArcGIS Desktop 10.8;** • **ArcGIS Pro 2.8.1;** and, • **AutoCAD Map 3D 2018.** Private roads as currently proposed will not need to be named. Private roads are not used as part of a municipal address. It is the City's policy to assign the street name of a municipal address based on the public street by which a vehicle may gain access to the site. If considering the possibility of making the proposed private road a public street, please be advised that new public streets on draft plans of subdivision must be named in accordance with the City's Street Naming Policy, ADM 220. Streets that are an extension to an already existing public street, must use the same name as the already existing street (please ensure the correct spelling prior to placing this name on any

Item	Details, Discussion & Conclusion (summary of discussion)
	drawings). If it is not a logical extension of an existing street, a request to the City can be submitted to geomatics@pickering.ca for the list of pre-approved street names reserved for use in Pickering. The new streets on the plan can be named from this list. Once it has been decided on which names to use on the plan please contact geomatics@pickering.ca to ensure that these names are set aside for the development. As there is a built form of multiple towers on a shared podium, a meeting with geomatics during the site plan pre-submission (perhaps at the endorsement stage) may be required to fully understand access to the towers through the podium in order to determine appropriate addressing. Access to the commercial/retail units for the purpose of addressing would need to be discussed as well.
Arnold Mostert, Manager, Landscape & Parks Development	• Provide an existing **Tree inventory and compensation plan/report**; • Provide a **Facility Fit Plan** for the proposed POPS as well as the rooftop/terraced areas that will be used as outdoor amenity space to demonstrate how they will be programmed; and, • The proposed park spaces are encouraged to be provided in the earlier phases of the development in order to provide outdoor amenity space for the residents of the first phase, and not left until the last phase.
Nadeem Zahoor, Manager of Transportation	• A **Transportation Impact Study (TIS)** is required for the proposed development and shall look at the impact the proposed development will have on the existing road network. The study must be prepared as per the Region of Durham and the City of Pickering TIS guidelines. Please provide terms of reference for the study to the City and the Region of Durham for approval, prior to starting the study; • Please ensure the width of the driveway to Kingston Road is shown on plans along with the proposed access width and the radiuses on the plan; • The applicant is required to provide autoturn maneuvering diagrams for the cars and the delivery trucks; and, • The Region of Durham is currently working on the Bus Rapid Transit (BRT) detailed design on Kingston Road. The applicant is advised to coordinate with the Region for the timing of the project.

Item	Details, Discussion & Conclusion (summary of discussion)
Peter Furnell, Supervisor, Building Permits (via email)	• The applicant is advised to contact Building Services to coordinate a Building Permit Pre-Consultation, once the applicant is further along in the Planning application process; • Application requirements related to Crane Swing Encroachment/Shoring, Site Servicing, or Foundation Conditional permits for each building can be discussed upon request; • Service Connection Permits from the Region of Durham are required; • Clearances from the Ministry of Transportation (MTO), Conservation Authorities, Region of Durham, and approved Planning Application information should be provided along with the Building Permit Application; • Conditional Permits are at the discretion of the Chief Building Official and cannot be applied for until a minimum of 20 days has elapsed after a submission for a full building permit application has been made; • If any alternate solution applications are being proposed, please reach out to the Building department to discuss well in advance of the application submissions; and, • Further Building Service comments will be provided in the later stages of the planning application or at the time of a building permit application.
Lalita Paray, Senior Planner, Sustainability (via email)	**Integrated Sustainable Design Standards (ISDS)** In September 2022, Council adopted new Integrated Sustainable Design Standards (ISDS) for all new development in the City to replace the 2007 Sustainable Development Guidelines. The ISDS defines a set of performance criteria for all new development in the City. These standards apply to all new Draft Plan of Subdivision and Site Plan applications submitted to the City under the *Planning Act.* The ISDS is a tool to assist the City in implementing and achieving its sustainability community vision through the development approval process. The new standards consist of two Tiers of performance measures that promote sustainable site and building design. Tier 1 is the minimum required level of achievement. To achieve Tier 1, developments must meet all applicable Tier 1 requirements. Tier 2 is a voluntary higher level of achievement. Tier 1 elements are required for all new developments arising from Site Plans and Subdivision applications deemed complete on or after January 1, 2023. Additional information is available on the City's website.

Item	Details, Discussion & Conclusion (summary of discussion)
	Application Requirements: a) As part of the **Official Plan Amendment and Zoning By-law Amendment** complete application submissions, the applicant is required to submit the **ISDS Mid to High-Rise Residential & Non-Residential Checklist and a Sustainability Report**. The Checklist and Report can be included as part of the Planning Justification Report to the City. b) As part of the **Draft Plan of Subdivision** and/or **Site Plan Application** complete application submission, the applicant is required to submit a Sustainability Report and a completed **ISDS Mid to High-Rise Residential & Non-Residential Development Checklist** , and, at a minimum, achieve Tier 1 performance standards. As per Council Resolution #982/22, the ISDS Tier 1 performance measure must be met to receive Site Plan approval. Please refer to the ISDS User Guide, page 5, for preparing a Sustainability Report and Appendix 1 for defined terms and resources list. Please note, for ISDS Performance Measure ER2, refer to the ISDS User Guide, page 14, for Tier 1 and Tier 2 Energy Performance Emissions' Total Energy Use Intensity (TEUI), Thermal Energy Demand Intensity (TEDI) and GHG Emission Intensity (GHGI) targets. The future Draft Plan and/or Site Plan Agreement will contain specific conditions relating to the implementation of the ISDS measures that the applicant has committed to undertake in their approved ISDS Checklists. The registered Draft Plan and/or Site Plan Agreement and the applicant committed performance measures (approved ISDS Checklists) will form part of the related Building Permit Application. **Sustainable Design Considerations for the Proposed Development** Sustainable and resilient design in new development supports public health, safety, and environmental protection and responds to climate change. Staff encourage the applicant to consider the inclusion/integration of the following: a) Incorporate energy efficiency beyond the Ontario Building Code requirements by including a prescriptive energy conservation pathway/measures such as Energy Star certifications, HVAC heating and cooling controls, triple pane windows with low emissive coatings, and supply on-demand water heating to reduce energy demand;

Item	Details, Discussion & Conclusion (summary of discussion)
	b) Staff have created a Resident Education Information Package Resource Guide to assist applicants in completing ISDS Performance Measure E1/Resident Education requirements. This performance criteria focuses on waste collection and disposal services; the residents' role as a steward of the natural environment including, natural landscaping, litter and illegal dumping, and responsible pet ownership; access to sustainable transportation options; and energy and water conservation measures and other sustainable features specific to the project that impact, or could be of interest, to the residents as deemed by the applicant; c) Minimize light trespass from buildings or sites to reduce development impact from lighting on nocturnal environments. Reduce sky-glow to increase night sky access and improve nighttime visibility through glare reduction. Consider Dark Sky Compliant practices for exterior lighting (allow no uplighting), and the use of high-efficiency exterior lighting that is full cut-off and/or contains a cut-off shield (ISDS, Performance Measure LN2); d) Provide AODA compliant private pedestrian walkways, private play areas and structures, and incorporate the community design principles using Crime Prevention Through Environmental Design (CPTED) principles to create a safe space (ISDS, Performance Measures N1, N2, and N3); e) For mid to high-rise residential development, use a combination of bird-friendly design treatments for a minimum of 90 percent of all exterior glazing within the first 16 metres of the building above grade or the height of the mature tree canopy (including all balcony railings, clear glass corners, parallel glass and glazing surrounding interior courtyards and other glass surfaces). FLAP Canada has released CSA A460: 19 Bird-Friendly Building Design Standard that outlines specific measures that can be taken to make new and existing structures safe for birds (ISDS, Performance Measure LN9); f) Promote urban agriculture and provide opportunities to grow local food. When preparing the proposed site design/landscape plan/green roof plan, consider an area on-site (roof space or ground area) where residents can establish a community garden for social, economic and well-being benefits; g) Promote the use of alternative transportation by reserving preferred parking spots for car sharing opportunities. Carpooling, carshare, hybrid vehicles, and electric vehicles, reduce environmental impact related to gas consumption. Dedicated parking spaces should be located in preferred areas close to building entries; and,

Item	Details, Discussion & Conclusion (summary of discussion)

	h) Promote the use of electric cars by providing electric vehicles (EV) charging stations. To be EV ready, infrastructure that enables the future installation of Electric Vehicle Supply Equipment (EVSE) must be provided at the time of construction. This includes providing an adjacent Energized Outlet capable of providing Level 2 Charing or higher to the parking space.
	
	Related Programs and Resources
	
	There are many incentives, programs, and technological examples that the applicant may find beneficial to investigate such as:
	
	• **Green Municipal Fund** (FCM) Sustainable Affordable Housing Fund**,** which supports local affordable housing providers in retrofitting existing affordable housing units or **constructing energy-efficient new build.**
	
	• **Energy Star** ®, a program that provides certification to buildings and consumer products that meet certain standards of energy efficiency.
	
	• **Enbridge Savings by Design Programs such as:**
	  ◦ Savings by Design Affordable Housing Program provides cash-back incentives for affordable housing builders and developers, assisting them to build cost-effective affordable housing, while at the same time, improve the comfort and quality of life for residents.
	  ◦ Savings by Design Commercial and Multi-Residential program gives the team free access to industry experts and technical tools to help build high-performance, resilient and sustainable buildings.
	
	• The following City of Toronto documents can be used as a resource: Best Practices for Bird-Friendly Glass, Best Practices for Effective Lighting, and the Toronto Green Roof Construction Standard.

Paula Viola, Senior Zoning Examiner	• At this time, Zoning staff do not have comments on the preliminary Site Plan. Zoning staff will review and comment on a draft Zoning By-law prior to it being sent to Council for consideration and adoption; and, • The applicant is required to obtain a Zoning Certificate to confirm zoning compliance as part of the complete application for the Site Plan Application review.

Item	Details, Discussion & Conclusion (summary of discussion)
	As part of the Zoning By-law Amendment Pre-Submission application, the following materials are required: • **Property Survey;** • **Detailed Site Plan** – fully dimensioned showing adjacent properties and building including setbacks; • **Floor Plans** – fully dimensioned indicating uses of all spaces; • **Site Grading Plans** for calculating height from average grade; and, • applicable **Building Elevations** and **Cross-Sections.** **Submission requirements associated with the application for a Zoning Certificate are as follows:** • completed Application Form; • Property Survey; • Detailed Site Plan – fully dimensioned showing adjacent properties and building including setbacks; • Floor Plans – fully dimensioned indicating uses of all spaces; • Site Grading Plans for calculating height from average grade; • Applicable Building Elevations and Cross-Sections; and, • Fee- Mixed Use ($695.00). **Note:** All drawings must be provided in a PDF format, submitted by email, to scale, fully dimensioned, and signed and dated. Staff may request additional drawings and information. • The Application for Zoning Certificate can be completed at the following link: https://forms.pickering.ca/Forms/CDD2303-Zoning-Certificate; and, • Payment can be made at the following link: https://onlineforms.pickering.ca/CDD/Zoning-Certificate.
Paul Wirch, Principal Planner, Policy	**Official Plan Designation** • The subject lands are designated "Mixed Use Areas - Mixed Corridor" in the City of Pickering Official Plan (POP). Mixed Corridors permit a minimum and maximum residential density over 30 and up to and including 140 units per hectare. The maximum Floorspace Index (FSI) in Mixed Corridors is up to and including 2.5; • The proposed density and FSI do not conform with the in-effect Official Plan, as such, a site-specific Official Plan Amendment application is required; • Kingston Road is designated as a Type B Arterial Road in the Official Plan;

Item	Details, Discussion & Conclusion (summary of discussion)
	• Policy 3.6(a) states that on “Mixed Use Areas on Schedule I, lands have or are intended to have the widest variety of uses and highest levels of activities in the City”. However, this policy needs to be read together with policy 3.6(d)(i): “Despite Table 6, densities and FSI’s may be limited to address concerns of good design, appropriate scale, and compatibility of development”, and policy 3.6(d)(ii), which refers to any pertinent neighbourhood specific policies in Chapter 12 of the Official Plan. Please note policy 12.10(a) stipulates that the highest mix and intensity of uses and activities in the City is encouraged in the City Centre Neighbourhood, which emphasizes the Council’s priority of maintaining an intensification hierarchy in the City; and, • According to Schedule IIID of the Official Plan, a Highly Vulnerable Aquifer Area is identified on the subject lands, although is not a high-risk land use according to Durham Region Official Plan. The proposed development, if approved, is required to comply with Policy 10.8(a)(iii) which requires that snow storage areas should be located on impervious surfaces that drain into the storm sewer and prevent salt run-off into the soil. Also, in accordance with policy 10.13(g) a Salt Management Plan will be required at the Site Plan Approval Stage to explain how the use of road salt will be minimized through on-site design and identify the location of snow storage so that contaminants and salt loads from snow melt are not carried into Highly Vulnerable Aquifers. **Official Plan Amendment 38** On November 22, 2021, Official Plan Amendment (OPA) 38 for the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas was approved by Pickering Council. The Kingston Road Corridor and Specialty Retailing Node Intensification Plan, endorsed in principle by Council, formed the basis for OPA 38. The Region of Durham approved OPA 38, with revisions, on November 4, 2022. The Region’s decision has been appealed to the Ontario Land Tribunal (OLT) by a number of property owners. Given the ongoing appeals, the information provided below reflects the Regionally approved policies in OPA 38. **Designation** Official Plan Amendment 38 Designation on Schedule XIV – Kingston Mixed Corridor and Brock Mixed Node Intensification Areas (sheet 2 of 4) the lands are located within the “Whites Precinct Intensification Area” and designated “Mixed Use Type A”, “Public Park”, “Gateways”, “POPS”, and “Future Public Street”.

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	Density The Kingston Mixed Corridor permits a minimum residential density of over 60 units per hectare, with no maximum. The maximum Floorspace Index (FSI) in the Kingston Mixed Corridor is 0.75 with a maximum up to and including 2.5. City Council may permit, in certain circumstances, FSI's beyond 2.5 and up to and including 5.0, where appropriate, through a site-specific zoning by-law amendment, subject to certain criteria (please refer to amendment no. 10 in OPA 38). Although OPA 38 needs to be reviewed in its totality, the proponent's attention is directed specifically to the following policies within OPA 38: • 11A.10.1(a) states that 13 storeys to a maximum of 35 storeys in height, to generally be located within appropriate major gateway locations at the intersection of transit spines and major arterials, along Highway 401, and proximate to highway interchanges; • 3.2(d) promotes the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas as Strategic Growth Areas in the City, secondary to the City Centre, for accommodating intensification and higher-density mixed uses in a more compact built form; • 11A.1(e) encourages the transformation of existing strip-commercial development and lots with single-detached dwellings into mixed use transit-supportive areas; • 11A.4.(a) within the Whites Precinct […] the highest densities and building heights shall be directed to the intersection of Kingston Road and Whites Road, with additional concentrations to the south of Kingston Road along Highway 401, extending east and west of the central cluster at Kingston Road and Whites Road; • 11A.4.(b) the Whites Precinct shall be promoted as a vibrant employment and retail hub; Accordingly, the development of Major Office uses is encouraged, particularly in proximity to the intersection of Kingston Road and Whites Road; • Section 15.5 Major Office amounts to approximately 4,000 square metres of floor space or greater or with approximately 200 jobs or more; • Section 11A.4.c a diverse mix of uses in the Whites Precinct is supported to promote the creation of a complete community and providing opportunities for residents to live-work-play in close proximity; and,

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	• As Kingston Road develops, and the form intensifies, it is expected to integrate commercial, office, and institutional uses with residential uses in order to become a complete community. This includes creating various sizes of commercial/retail spaces. The applicant is advised that while the proposed use conforms with the Official Plan, the ratio of commercial GFA to residential units requires further justification. **Housing** City Council shall require that a minimum 25 percent of new residential construction, on a City-wide basis, be of forms that would be affordable to households of low or moderate income, reflecting affordable housing forms identified in "Appendix I – Quality of Life Indicators and Performance Targets" (Section 6.4A). Affordable means annual housing costs (rent or mortgage payments) that do not exceed 30 percent of gross household income. As well, the Pickering Housing Strategy & Action Plan, 2021-2031, identifies the need for additional rental, affordable and accessible housing. The proponent is requested to provide an Affordable Housing Brief to assist with the review of this development application and housing monitoring within the City, which should include the following information: 1. Average purchase price; 2. Average rental price per unit type; 3. Number of units that qualify as "affordable" based on the Pickering Official Plan; 4. Total number of rental units; 5. Breakdown in type of rental units (i.e. apartment 1-bedroom, 2-bedroom, 3-bedroom units, Townhouse 2-bedroom, 3-bedroom units etc.); a. Estimated proposed monthly rent per type of unit; b. Total number and type of barrier-free accessible units; and c. Current CMHC vacancy rate for the associated market area. 6. Average Market Rents in the Primary Market Compared to Affordable Rents Based on Renter Income Deciles (most recent year available); 7. Does the development proposal include or offer opportunities to accommodate additional dwelling units;

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	8. Information on any grants or funding agreements entered into with the Province and/or Region of Durham which may have been considered for the development proposal; and, 9. Provide a rationale if your proposal does not include any affordable housing. Further, the predominant residential type and density proposed is high-rise residential. The proponent is encouraged to consider the inclusion of mid-rise residential (more commonly known as the "missing middle"), to provide a broader variety of housing options. **Site Specific Considerations:** Policy staff offer the following comments for consideration of the proposal: • The proposed development does not include a public park block as identified within the Whites Precinct Intensification Area. The applicant is advised to revise the plan to accommodate a public park block; • The proposed density and proposed building heights do not conform with the in-effect Official Plan. Should OPA 38 come into effect, the proposed heights, densities, and FSI may be considered subject to further justification. More information is required to demonstrate how each phase of the proposed development will contribute to the creation of a complete community on-site. This includes providing for the detail retail, service (i.e. child care), and amenity needs of the proposed residents as well as the broader area. In addition, the intensity of development conceived near the intersection of Kingston Road and Whites Road also anticipates the inclusion of Major Office; • The reduction of parking rates is appropriate in locations that are, not only serviced by frequent transit, but also in close proximity to services and amenities. The corresponding reduction of commercial GFA and increase of residential density is incompatible with this outcome; • Each phase of development will need to provide an appropriate amount of amenity space for the residents. This is distinct from the public parkland requirement; • The first phase of development, along the Kingston Road and Whites Road frontages, is expected to include a significant amount of office space in addition to commercial/retail space; and, • 11A.9.2b(iv) if Major Office is not considered in conjunction with this development, an **Office Demand Study** must be provided.

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	Submission requirements are as follows: 1. **Planning Rationale Report** is required to justify the proposed density, FSI, parking ratio, ratio of commercial GFA to residential units, and the demand for Office Space; 2. **Office Demand Study**, to be peer reviewed at the expense of the applicant; 3. **An Affordable Housing Brief**; and, 4. **A Hydrogeology and Water Budget Study** for development in Highly Vulnerable Aquifer Areas. The applicant is advised that all items identified are required to be provided at the pre-submission stage.
Nilesh Surti, Division Head, Development Review & Urban Design & Amanda Dunn, Principal Planner, Development Review	**Official Plan** • The lands are currently designated "Mixed Use Areas – Mixed Corridor" within the City of Pickering Official Plan. This designation establishes a minimum and maximum net residential density of over 30 and up to and including 140 units per net hectare, and a maximum Floorspace Index (FSI) of 2.5; • Please note the lands are subject to City initiated Official Plan Amendment 38, which was adopted by Council and approved by the Region of Durham, but is currently subject to OLT appeals. Details with respect to OPA 38 are available here: https://www.pickering.ca/en/city-hall/city-initiated-opa-20-004p.aspx; and, • The subject lands are designated 'Mixed Use Type A' within the Whites Precinct in OPA 38. The Intensification Plan identifies that the Whites Precinct extends from Rosebank Road to the west, and to Fairport Road to the east. Further, the gateway intersection of Kingston Road and Whites Road is the focal point for the Whites Precinct. The greatest heights and densities are clustered in close proximity to the gateway, with additional tall buildings extending east and west of the intersection at Kingston Road and Whites Road within the southern portions of the parcels to the south of Kingston Road. Section 11A.10.1 states that high-rise buildings consisting of buildings 13 storeys to a maximum of 35 storeys in height, to generally be located within appropriate major gateway locations at the intersection of transit spines and major arterials, along Highway 401, and in proximity to highway interchanges.

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	Housing • Section 6.4 of the Pickering Official Plan states that City Council shall require a minimum 25 percent of new residential construction on a City-wide basis, to be of forms that would be affordable to households of low and moderate incomes; • The applicant is advised to provide clarification on the proposed tenureship of the development (ownership and/or rental units); and, • Staff require the applicant to explore opportunities to provide affordable housing units within this development. **Density and FSI** • OPA 38 permits a maximum Net Residential Density of over 60 dwelling per hectare and a maximum Floor Space Index (FSI) of over 0.75 and up to and including 2.5. Section 10.F of the Official Plan states that in certain circumstances, a floor space index beyond 2.5, up to and including 5.0 may be considered, where appropriate, through a site-specific zoning by-law amendment and subject to the following criteria: i. that the site is generally located in an appropriate gateway location and/or adjacent to Highway 401; ii. that the proposal is compatible with adjacent land uses, particularly stable residential neighbourhoods, in terms of massing, height, scale and transition; iii. that the applicant demonstrate that the proposed development would not preclude other properties within the precinct from developing or redeveloping to their planned potential; and, iv. that the proposal meets the general intent of the policies of Chapter 11A of this Plan. • Section 11A.4 states that development within the Whites Precinct shall be in accordance with the following: a) the highest densities and building heights shall be directed to the intersection of Kingston Road and Whites Road, with additional concentrations to the south of Kingston Road along Highway 401, extending east and west of the central cluster at Kingston Road and Whites Road; b) the Whites Precinct shall be promoted as a vibrant employment and retail hub; Accordingly, the development of Major Office uses is encouraged, particularly in proximity to the intersection of Kington and Whites Road;

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	c) A diverse mix of uses in the Whites Precinct is supported to promote the creation of a complete community and providing opportunities for residents to live-work-play in close proximity; d) Prioritize the development of an attractive concentration of vibrant primary and secondary active frontages at grade along Kingston Road; and, e) Pedestrian-oriented public realm improvements, including opportunities to introduce boulevard enhancements and new or reconfigured pedestrian paths and sidewalks, to enhance the pedestrian experience in areas which are predominantly auto-oriented will be prioritized. • Section 11A.9.2 of the Intensification Plan establishes that 'Mixed Use Type A' land use designations as shown on Schedule XIV shall have the greatest density and represent the highest-intensity uses within the intensification areas with a combination of higher density residential, commercial, and retail uses including those which serve a broader area, and office uses in mixed use buildings, or in separate buildings on mixed use sites. The applicant shall confirm the density and FSI calculation. The applicant is advised that the density and FSI should be calculated on a net site area, which excludes public right of ways/road widenings, or any lands to be conveyed to a Public Authority. **Office/Commercial/Retail Space** • Office uses are encouraged, particularly Major Office uses and major community (institutional) uses, to be located in Mixed Use Type A Areas. Accordingly: a) These uses should be predominately directed to major intersections or gateways where access to existing and planned transportation infrastructure is greatest, including higher order transit facilities; b) Council will seek the accommodation of office space as part of developments within 'Mixed Use Type A' Areas; c) Protection for future office space may be met through demonstrating phasing and/or including building types that can be easily converted to office uses over time; and,

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	d) In addition to the complete application requirements in Section 16 of the Plan, Council may require the submission of an **Office Demand Study**, where Major Office uses are not being proposed at major gateway locations. The applicant is advised that the proposal shall incorporate major office within the proposed development in accordance with Policy Section 11A.9.2. • Section 11A.9 provides the following policies which are to be applied to all development within the intensification areas. Accordingly, City Council shall: a) Promote the integration of residential and office uses in conjunction with retail, commercial and institutional uses in support of developing complete communities; b) Ensure the function of the intensification areas as key retail shopping destinations within the City, supporting various sizes and types of retail uses, is maintained and that expansion and establishment of new office and commercial uses is encouraged; c) Further to Section 11.A.9 (b), where redevelopment of properties with existing businesses is proposed: i) Encourage early and on-going communication between the proponent and existing tenants; ii) Seek on-site retention of existing businesses, wherever possible, as part of the redevelopment through measures including provision of similar unit sizes and phasing, where feasible and appropriate, to allow the opportunity for business to relocate on-site; and, iii) Seek to assist affected business owners in finding opportunities for relocation within the community where retention on-site is not possible or desired. In accordance with the above policies, the applicant is strongly encouraged to reincorporate commercial, retail, and major office uses back within the proposed development to ensure there are a broad mix of uses to serve the future residents/visitors of this development, and to ensure a more complete mixed-use development. The applicant is advised that for previous development applications, Council has requested that commercial uses be replaced at a 1:1 ratio. Further, the applicant is encouraged to commence discussion with regards to the proposed development with

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	existing tenants prior to submitting applications (i.e. the types of applications the applicant will be submitting, timeframe for construction, etc.) The applicant is also strongly encouraged to accommodate and provide leasing opportunities to existing tenants first in the proposed new lease space. **Phasing of Development** • Section 11A.12.6 identifies that City Council shall: a) encourage, where possible, shared driveways, parking ramps and servicing areas between two or more properties to maximize building frontages and minimize the number of required curb cuts; b) where such shared facilities are provided, require each landowner to provide a reciprocal easement in favour of the other landowner(s); c) seek establishment of service streets and laneways with access off streets with lower levels of traffic, and to avoid interrupting active street frontages; and, d) require service laneways to be designed in accordance with the applicable urban design guidelines. The applicant is advised to clarify if both phases of development will have access from one driveway, or will a secondary service street or laneway be provided. • Section 11A.14(a) of OPA 38 requires development applications on larger sites, identified through the implementing Zoning By-law, to provide a block development plan to demonstrate the full build out of new streets and blocks within the site, potential connections to adjacent sites, redevelopment within all future blocks and the provision of supporting open spaces and community infrastructure as required; • Further to Section 11.14(a), OPA 38 also states that City Council shall: d) support the use of the Holding provisions in the *Planning Act* and require where necessary, proponents to enter into agreements with the City, Region, other agencies, and adjacent landowners as appropriate, respecting various development related matters including but not limited to; and,

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	f) servicing or relocation of infrastructure including any required studies; (ii) requiring a multi-modal transportation study for proposed developments that are anticipated to generate 75 or more vehicle peak hour trips (two-way), or where site and design characteristics may result in traffic or transportation concerns, to assess the impact on the transportation system and the timing and need for future improvements; (iii) entering into cost-sharing and front ending agreements; (v) providing or exchanging easements over lands where necessary; (vii) requiring a comprehensive functional servicing and stormwater management plan that addresses stormwater management on a site-by-site basis; and, (viii) requiring a block development plan. The applicant shall illustrate how the existing retail/commercial uses will operate through the proposed phased development through a required **Phasing Plan**. The applicant is advised that should OPA 38 be in full force and effect at the time that a Pre-Submission and/or Application is submitted, a **Block Plan** will be required to illustrate how the proposed development will not preclude future development of adjacent lands to the east and identify any potential easements required to ensure adequate east/west connections are provided. The applicant shall clarify and distinguish between the private and public streets within the proposed road network inclusive of proposed right-of-way widths, and further shall identify through which development process the development proposal is intending to utilize in order to create the proposed development blocks (i.e. draft plan of subdivision application). Staff encourage the applicant to commence dialogue with abutting lands to the east to discuss their long-term development plans to ensure orderly development and to determine if any cost-sharing will be required.

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	Building Design/Site Layout • The Draft Urban Design Guidelines (DUDG) for the Kingston Road Corridor and Specialty Retailing Node identifies that the subject lands are within the Whites Precinct; • The DUDG states that the gateway intersection of Kingston Road and Whites Road is the focal point for the Whites Precinct. The greatest heights and densities are clustered in close proximity to the gateway, with additional tall buildings extending east and west of the intersection at Kingston Road and Whites Road within the southern portions of the parcels to the south of Kingston Road. Coupled with increased heights and densities, this will help to create a vibrant commercial district which attracts a significant amount of pedestrian foot traffic; • The DUDG outlines that built form should conform to an angular plane extended at a 45-degree angle from the front property line, beginning at a height of 80 percent the width of the adjacent right-of-way. An angular plane is one of many tools intended to help shape the scale, height, spacing, and character of development, and assist in achieving transitions in an area by limiting the overall height. The applicant is required to demonstrate how the proposal complies with the angular plane requirements of the DUDG; • Section 2.12 Streetwall states that a consistent streetwall should be maintained along Kingston Road and all primary frontages. The minimum streetwall height along all streets shall be 3 storeys, with a maximum height of 6 storeys. The applicant is advised that the proposed development within Phase 1 consisting of a 35-storey building connected to a 12-storey building needs to be revised in accordance with the above policy. In accordance with Section 2.12 of the DUDG, a streetwall is required with a height from a minimum of 3 storeys to a maximum of 6 storeys. The applicant is advised to provide a building form that provides a building podium which is in alignment with the above policy. The applicant shall advise if the proposed 12 and 35 storeys will be in addition to the proposed podium or inclusive of the 3-6 storey podium. Further, there shall be appropriate separation distance provided between the proposed 12 storey and 35 storey towers. • In accordance with Section 2.2 i. and ii. of the DUDG block lengths should generally range between 100 and 150 metres to promote permeability within the streetscape, support walkability and increase the ease of pedestrian and cyclist movement;

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	• Where a block is longer than 150 metres and shorter alternatives are not feasible, mid-block connections shall be introduced through pedestrian paths or linear parks. Pedestrian-scale lighting should be implemented along these paths to increase comfort and safety; • Block layouts should be designed to maximize views and vistas through development blocks and towards gateways and natural heritage features; • Section 2.15 Tall Buildings state that tall buildings should generally be located within gateways, including at the intersection of transit spines, major arterials, along the highway and in proximity to highway access. Podiums should have a minimum height of 3 storeys and a maximum height of 6 storeys to create a comfortable public realm; • The DUDG states that building towers shall be subject to a minimum 25 metre separation distance, measured between the exterior edge of the building face. Buildings shall have a maximum tower floor plate of 750 square metres. • The DUDG states tall buildings over 13 storeys in height, shall provide a minimum separation distance of 15 metres, and shall be provided between facing buildings on sites with multiple buildings. On multi-site buildings it is encouraged that buildings are offset or angled away from each other to maintain privacy between facing units, as well as 15 metres of separation distance where adjacent buildings are proposed within a podium (Section 2.3.2 vi. and vii.); • Section 2.3.3.iii. identifies that buildings fronting Kingston Road shall be setback 5.0 metres from the front property line and buildings shall be setback a minimum of 2.0 metres from new public and private streets that are internal to the development block and 3.0 metres from parks and other open spaces; and, • In accordance with Section 2.3.3 vi. where retail and commercial uses are located, setback areas should accommodate spill-out uses from commercial activity (i.e. patios, displays, waiting areas) to improve the pedestrian experience. These areas should be primarily hardscaped to act as an extension of the sidewalk and accommodate for higher levels of foot traffic. The applicant is encouraged to review Section 5.3 Intersection Sites of the DUDG and associated policies which states that intersection sites are prominent sites seen from multiple vantage points, and as such require enhanced design attention based on their location within the precinct.

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	The applicant is required to ensure that appropriate streetwalls/podiums are provided along Kingston Road and ensure the proposed built form complies to the policies relating separation distance and maximum floorplate. The applicant is reminded that built form that exceeds 13 storeys in height (inclusive of podium) is subject to the Tall Building provisions. **Public Road** • Section 11.14(b) of OPA 38, states that City Council shall require the expansion of the street network into a finer grid of streets and connections to occur incrementally with development, with new public streets being secured through the development application process and/or through cost-sharing by benefitting landowners, to the satisfaction of the City; and, • As identified within OPA 38, Section 11A.1.12.3(a) and (b) the policies of Section 4.11, require the design of new streets and the design and extension of streets identified on Schedule XIV to be connected to existing streets, and have block lengths generally no longer than 150 metres and block depths generally not less than 60 metres to provide a finer grid of walkable and interconnected development blocks over time. Further, all new or re-designed streets, as appropriate, to be complete streets with public amenities including sidewalks, enhanced paving in bust pedestrian areas, cycle paths or multi-use paths, and landscape and furniture zones. The applicant is advised in accordance with Schedule XIV of OPA 38, a future public road is identified south of Kingston to provide access to the subject lands and abutting lands to the east, which shall be developed as a complete street. The applicant is also required to advise whether there will be a secondary access proposed for the site, such as a service laneway, or whether both phases of development be accessed through a singular access. **Gateways** • The subject lands are located within a Gateway. The DUDG identifies that gateways are entry points into streetscapes, areas or neighbourhoods, often signified by a distinctive public realm or built form and enhanced through site and building design. Section 2.14 identifies that:

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	i. Buildings with significant heights and massing should be located at gateway locations, including both mid-rise and tall buildings; ii. Buildings and landscape design should aim to create a sense of arrival; iii. Gateways should incorporate public gathering spaces, such as plazas and urban squares; iv. Buildings at gateways are encouraged to include recessed corners to enlarge the public realm at key intersections to support additional spill-over space for active commercial uses; v. Primary building entrances should be located at gateways; vi. Building articulation, including vertical projections, recessions, design treatments and other architectural details, is encouraged at gateway locations to create enhanced visual interest and a distinct sense of place; vii. Heights, massing, and articulation of buildings at gateways shall consider the aesthetics and orientation of view corridors approaching gateways to ensure a cohesive and prominent streetscape; and, viii. Careful consideration should be given to views of the gateway as traffic approaches from the north and south crossing the highway, with an aim to create a balance between the east and west sides and provide a sense of arrival. **Parking** • Section 2.5.3 i) and ii) of the DUDG identifies that new developments are encouraged to reduce or minimize surface parking on site, in order to reduce the urban heat island effect and promote more compact development. Parking shall be located at the side or rear of the site where it is neither visible from the street nor blocking pedestrian access. Although staff acknowledge that there should be surface parking available for retail and commercial uses and for accessibility purposes, the amount should be reduced in accordance with Section 2.5.3 of the Official Plan, and is recommended to be provided below grade. The space currently proposed as surface parking area within Phase 1 could then be utilized for other uses, such as park/amenity areas.

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	• Further the design of parking areas that are visible from the highway and streets, edges along parking areas shall be defined and softened through tree planting, landscape berms, pergolas, and other similar features; and, • In accordance with Section 2.5.3 xii. consideration should be given to charging stations for electric vehicles and short-term bicycle storage space in the design of surface parking lots. The proposed development is providing a parking ratio of 0.89 spaces per unit. The applicant has not confirmed the proposed visitor parking rate, and clarification is required on the amount proposed. Further clarification is required if the proposed parking (per residential unit and visitors) will be provided below grade or within the podium and/or surface parking). The proposed parking rate for commercial uses is 4.5 per 1000 square feet (4.5 spaces per 93 square metres). The applicant is advised that the in-effect Zoning By-law 2324-86 requires a rate of 5.0 parking spaces for each 93 square metres of part thereof of gross leasable floor area. Further, Zoning By-law 2324-86 states that a “parking space” shall mean a usable and accessible area of not less than 15.95 square metres, for the temporary parking of a vehicle, but shall not include any portion of a parking aisle or driveway. A **Parking Justification Study** will be required to justify the reduction to the site-specific commercial parking rates inclusive of proposed visitor parking rates. **Park Space** • The Intensification Plan identifies a well-spaced distribution of public realm features across the Whites Precinct. The Plan identifies two Public Gateway Plazas located on the south side of the intersection of Kingston Road and Whites Road, one being within the subject lands. These Public Gateway plazas will act as prominent locations for public gathering and activity, and are expected to receive heavy pedestrian foot traffic as a key hub of commercial and retail activity. The applicant is encouraged to review Section 3.6 Gateway Plazas contained within the DUDG; • A Privately Owned Publicly- Accessible Spaces (POPS) is also identified as being within the subject lands, which will allow private development to contribute to the construction of open space for public enjoyment. These are recommended to take the form of hardscaped urban squares which are able to host active programming;

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	• The introduction of high-density residential uses on this side of the roadway will require sufficient at-grade park space be provided on-site to accommodate future residents. Please include a **Facility Fit Plan** as a part of the conceptual **Landscape Plan**, demonstrating how the at-grade amenity space could be utilized; The applicant is encouraged to review Section 11A.11 (a), (b), (d), (e), (g), and (h) of OPA 38 which speak to privately-owned publicly accessible spaces (POPS), indoor and outdoor amenity spaces, green roofs as a component of private outdoor amenity space for high density residential development and amenities for pedestrians within the public realm. Further, in accordance with Section 11.A.11.1 and 11.A.11.2, proposed Public Parks should have at least one frontage on a public road, although staff would prefer there be frontages on two public roads for this site and details related to proposed POPS should be outlined through detailed a Block Plan and **Facility Fit Plan**; The applicant shall confirm the percentage of the proposed POPS space of the site area as well as the total amount (land area i.e. square metres and percentage) of the proposed Public Park in relation to the net site area. The applicant is advised that POPS space does not contribute to the parkland dedication and public easements will be required over both the Gateway Plaza and the proposed POPS area. Further, the applicant is required to provide more rationale as to how the proposed terraced POPS will be functional and accessible to the general public and in relation to the proposed connection with the private amenity proposed. A greater amount of parkland will be required to serve the proposed density and is required to be provided within the first phase of the development to serve the resident's needs. Park blocks are to be of a sufficient size to accommodate a range of activities. The applicant is encouraged to review Section 3.8. x) of the DUDG which states POPS should provide amenities including seating areas, pedestrian-scale lighting, bicycle racks, garbage cans, and public art to create a positive walking and cycling environment. Amenities should compliment the character of the surrounding public realm and active ground floor uses. • It is identified within the DUDG that POPS designed as Parks should: xi. be located to provide areas of open green space where intensified development is expected or planned to occur; xii. have a dimension of a minimum of 0.2 ha, with larger spaces preferred; and,

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	xiii. include seating areas, walkways, a playground with junior children's play equipment, an open turf area, and tree canopy. The proposal shall be revised to provide public parkland, conveyed to the City, free and clear of all encumbrances and easements. The applicant is also advised that based on recent approvals for large mixed-use proposals, parkland has been conveyed at a minimum of 10% of the site area. **Waste Collection** • Staff encourage the applicant to meet the Region's Waste Collection requirements for waste collection on private property to enable regional waste collection; and, • Should regional waste collection not be available to service the proposed development, the City will require a Waste Management Plan be submitted that provides details on private collection, including a waste diversion plan highlighting how recycling and composting will be implemented. **Noise Attenuation** • Please ensure that the submitted **Noise and Vibration Study**, required by the Region of Durham, provides an analysis of any noise impacts on the outdoor amenity space proposed and outlines any mitigation measures required. **Future Applications** • The applicant shall advise on how the proposed development blocks are to be created and which planning process will be utilized. This will determine the need for a Draft Plan of Subdivision Application; and, • A site plan application is also required; however, the Council endorsed process requires the associated Official Plan and Zoning By-law Amendment applications be approved first, prior to the submission of an associated Site Plan Application. **Zoning By-law 2324/86 of By-law 3036** • The subject lands are zoned General Commercial 'C-13' as per Zoning By-law 2324/86;

Item	Details, Discussion & Conclusion (summary of discussion)
	• The 'C-13' zone permits an assembly hall, bakery, business office, commercial club, commercial-recreational establishment, commercial school, dry cleaning depot, financial institution, food store, laundromat, personal service shop, private club, professional office, public club, restaurants – type A and retail store. The permitted commercial uses are permitted a maximum building height of 12.0 metres and stipulates that the aggregate of the gross leasable floor area of all buildings shall not exceed 6,500 square metres; and, • A major Zoning By-law amendment application is required. A draft of the site-specific Zoning By-law Amendment must be submitted as part of the rezoning application which takes into consideration the existing site-specific exceptions which are in place. • The following is required in support of the proposed applications: ◦ **Conceptual Site Plan;** ◦ **Conceptual Elevations and Floor Plans;** ◦ **Planning Rational**, which identifies how the proposal will achieve conformity with the current Official Plan policies, emerging policies proposed through OPA 38, Kingston Road Corridor and Specialty Retailing Node Intensification Plan and Draft Urban Design Guidelines and also includes a draft of the Official Plan Amendment and Zoning By-law Amendment; ◦ **Affordable Housing Brief;** ◦ **Block Plan** (subject to OPA 38 being in full force and effect)**;** ◦ **Phasing Plan;** ◦ **Urban Design Brief;** ◦ **Landscape Plan**, which includes a **Facility Fit Plan** for the proposed amenity space; ◦ **Shadow Study;** ◦ **Wind Study;** ◦ **Tree Inventory and Preservation Plan;** ◦ **Transportation Impact Study**, which includes a **Parking Justification Study** and outlines Transportation Demand Management Measures; and, ◦ **Auto-Turn diagrams** for waste management and emergency vehicles.

Item	Details, Discussion & Conclusion (summary of discussion)
	Technical Reports Required
	Please see attached Technical Report Check List • With respect to Official Plan or Zoning By-law amendments the City may, at the time of a recommendation report to Council, require drawings in forming the official Plan or zoning schedule, in CAD or GIS format (compatible with either ArcGis Desktop 10.7.1, ArcGis Pro 2.8.1, or AutoCAD Map 3D 2018), and such files need to be georeferenced with a geographic coordinate system of: NAD83 UTM Zone 17N. All PDF documents accepted that are intended to be uploaded to the City's website, must be accessible. Documents may include studies, reports, plans, presentations, and other PDFs. The City of Pickering will not display external vendor documents on its website if they are not accessible, in order to meet the Province's *Accessibility for Ontarians with Disabilities Act* (AODA) Information and Communications Standards To learn more visit WCAG 2.0 Level AA standards. **1. Accessibility Criteria** All studies, reports, plans and presentations etc. that result from this project must be provided to the City in an accessible format compatible to Adobe Acrobat XI or higher, meeting WCAG 2.0 Level AA standards. **2. Verification Process** Prior to documents being posted on the City's website for this project, a letter of verification, stating that the documents provided are accessible must be received. The attached **City's Accessible Documents Vendor Checklist** is to assist you in creating documents in an accessible format. The following tools/service providers may also assist you in the accessibility checking/compliance: • Free online accessibility checker tool • Adobe Acrobat Accessibility Checker • Aequum Global Access • AbleDocs • Equidox • eSolutions

	Fees Requirement
	For the proposed development the following fees are required: **City of Pickering** **City Development Department** • Please see the fee schedule attached and online on the City's website: https://www.pickering.ca/en/city-hall/resources/Fees.pdf; and, • Fees do not include registration costs and/or disbursements. **Engineering Services** • Please contact engineering services for the required fees. **Region of Durham** • The planning and Economic Development Department fees can be found on the Region's website: https://www.durham.ca/en/resources/en/2023_Planning-Ec-Dev-post-Jan-01-2023.pdf; • The applicant/Owner must confirm the fees prior to submitting their application; • Certain fees shall be submitted depending on the type of development application. The Region can accept cheques or e-payments via payments@durham.ca. It is imperative that the memo field be filled out before sending the Region payment. The applicant is required to reach out to the Region before the e-payment is submitted to the Region for the specific requirements to complete the memo field. **TRCA** • Please contact to confirm.

AD:nr
J:\Documents\Development\D-1000\D-1000-001\2023\PRE 39-23\5. Comments Summary\705 Kingston - Meeting Summary.doc

Copy: Mallory Nievas, The Biglieri Group
Nik Papapetrou, Plaza Partners
Ornella Richichi, Plaza Partners
Tom Bosnjak, Plaza Partners
Steven Kwan, BA Group

Alexander Hajjar, Ministry of Transportation
Vannitha Chanthavong, Region of Durham
Peter Castellan, Region of Durham Works Department

Paal Helgesen, (Acting) Division Head, Water Resources & Development Services
Nilesh Surti, Division Head, Development Review
Arnold Mostert, Manager, Landscape & Parks Development
Paul Wirch, Principal Planner, Policy
Irina Marouchko, Senior Water Resources Engineer
Paula Viola, Senior Zoning Examiner
Lalita Paray, Senior Planner, Sustainability
Laura Calvelli, Project Manager, Development Approvals
Nadeem Zahoor, Coordinator, Transportation Engineering

Materials and Studies Required for PRE 039/23
Submissions for Official Plan and Zoning By-law Amendment

Please note: Required materials and studies are subject to change based on revisions to the proposal.

Plans/Studies/Reports	POP Reference	Required (Y/N)	Comments
Planning Justification Report	16.5A(i)	**Y**	Include draft OPA and ZBA. To be signed and stamped by a professional planner.
Traffic Impact Study	16.5A(ii)	**Y**	All reports to be signed and stamped by a professional engineer. Terms of Reference should be reviewed by the Region of Durham and City.
Shadow Study	16.5A(iii)	**Y**	Test times shall be done hourly between 9:18 am and 7:18 pm on March 21, June 21, September 21 and December 21. In addition, the study should also evaluate shadow impacts within the development site, including an assessment of the shadow impact on any proposed outdoor amenity, courtyard area or amenity space. The Shadow Study shall include a written summary of the findings.
Wind Study	16.5A(iv)	**Y**	
Heritage Conservation Compliance Statement	16.5A(v)		
Archaeological Assessment	16.5A(vi)		
Functional Servicing Study/ Site Servicing Study	16.5A(vii)	**Y**	All reports to be signed and stamped by a professional engineer.
Stormwater Management Report	16.5A(viii)	**Y**	The SWM Report can be combined into a Functional Servicing and Stormwater Management Report (FSSR) for functional design stages. All reports to be signed and stamped by a professional engineer.
Flood Plain Impact Engineering Study	16.5A(ix)		
Site Suitability Study	16.5A(xi)		
Environmental Impact Study	16.5A(xii)		
Natural Heritage Evaluation	16.5A(xiii)		
Hydrological Evaluation	16.5A(xiv)		
Hydrogeological Report	16.5A(xv)	**Y**	All reports to be signed and stamped by a professional engineer and shall include a Water Budget Study.
Watershed/Sub-watershed Study	16.5A(xvi)		
Aggregate Extraction Impact Study	16.5A(xvii)		
Aggregate Extraction Assessment Study	16.5A(xviii)		

Assessment of Lands within 500 metres of Known Waste Disposal Site	16.5A(xix)		
Phase I Environmental Site Assessment	16.5A(xx)	Y	Or a Site-Screening Questionnaire. All reports to be signed and stamped by a professional engineer. The Phase 1 ESA Report must be accompanied by the Regional Reliance Letter and Certificate of Insurance.
Phase II Environmental Site Assessment			
Record of Site Condition			
Contamination Management Plan (High Aquifer Vulnerability Area)	16.5A(xxi)		
Contamination Management Plan (near Wellhead protection Area)	16.5A(xxii)		
Waste Disposal Community Impact Study	16.5A(xxiii)		
Noise and Vibration Study	16.5A(xxiv) & (xxv)	Y	Any proposed outdoor amenity area should be specifically looked at in the noise and vibration study. All reports to be signed and stamped by a professional engineer.
Dust/Odour Control Study	16.5A(xxvi)		
Photometric Lighting Plan	16.5A(xxvii)		Will be required at the time of Site Plan submission.
Sustainable Development Report and Checklist	16.5A(xxix)	Y	
Rental Housing Conversion Study	16.5A(xxx)		
Urban Design Brief	16.5A(xxxi)	Y	Can be included in the Planning Justification Report.
Architectural Design Study	16.5A(xxxiii)		
Groundwater Impact Study	16.5A(xxxv)		
Water Management Plan	16.5A(xxxvi)		
Other Plans/Studies/Reports		**Required (Y/N)**	**Comments**
Parking Standard Analysis/Justification		Y	Can be included in the Traffic Impact Study. All reports to be signed and stamped by a professional engineer.
Construction Management Plan			Details are to be included as part of the Functional Servicing and Stormwater Management Report. However, a full Construction Management Plan will be required at the time of Site Plan submission.
Landscape/Parks Plans		Y	Include a concept plan for both public and private realm (which includes outdoor amenity space on the podium, rooftop and/or at grade.
Facility Fit Plan		Y	Should include all proposed recreational space and programming.

Tree Inventory and Assessment Report/Plan	**Y**	All reports to be signed and stamped by an arborist.
Geotechnical Report	**Y**	All reports to be signed and stamped by a professional engineer.
Railway Corridor Safety Study		
Affordable Housing Brief	**Y**	Can be included as part of the Planning Justification Report.
Detailed Site Plan and Coloured Site Plan	**Y**	Should be fully dimensioned showing adjacent properties and building including setbacks. Site Plan should also include a phasing plan.
Block Development Plan	**Y**	Should include adjacent lands to the east.
Access & Fire Route Plan	**Y**	Can be included on the site plan.
Site Grading Plan	**Y**	Storm floodplain limit to be plotted on drawings.
Erosion & Sediment Control Plan	**Y**	
Site Servicing Plan	**Y**	
Lot Survey	**Y**	
Coloured Elevations & Renderings	**Y**	Should also include cross-sections.
Conceptual Floor Plans	**Y**	
Waste Management Plan		Will be included as part of the future Site Plan submission.
Autoturn Analysis for Fire, Delivery and Waste Vehicles	**Y**	Can be included in the Traffic Impact Study.
OBC Matrix		Will be included as part of the future Site Plan submission.
Sanitary Sewer Capacity Analysis Report	**Y**	Can be included as part of the required FSSR.
Phasing Plan	**Y**	Shall indicate how existing businesses will continue to operate through the planned phased development.
Office Demand Study	**Y**	
Electronic copies of all materials in .pdf format on USB; and a letter of verification, stating that the documents provided are in an accessible format and meet the AODA standards	**Y**	All PDF documents that are intended to be uploaded to the City's website, must be accessible in order to meet the Province's Accessibility for Ontarians with Disabilities Act (AODA) Information and Communications Standards. Please see attached the Accessible Document Checklist for Vendors to provide assistance on creating an accessible PDF document.
Plans in CAD or GIS format	**Y**	Compatible with either ArcGIS Desktop 10.8, ArcGIS Pro 2.8.1, or AutoCAD Map 3D 2018 – and georeferenced to NAD 83 UTM Zone 17N.

Please provide all drawings and reports via a File Share link, to be provided by City staff.

Appendix B:
Terms of Reference and Correspondence

March 1, 2024

Nadeem Zahoor
Manager of Transportation, Engineering Services Department
City of Pickering
E-mail: nzahoor@pickering.ca

Doug Robertson
Senior Project Manager, Works Department (Transportation Infrastructure Division)
Regional Municipality of Durham
E-mail: doug.robertson@durham.ca

Alexander Hajjar
Senior Project Manager Toronto-Durham, Highway Corridor Management Section (Central Operations)
Ministry of Transportation
E-mail: alexander.hajjar@ontario.ca

RE: TRANSPORTATION IMPACT STUDY TERMS OF REFERENCE FOR 705 KINGSTON ROAD, CITY OF PICKERING PRE 039/23

Dear Nadeem, Doug, and Alexander,

Introduction

This document outlines the scope, objectives, methodologies, and deliverables for the Transportation Impact Study (TIS) to be prepared in support of an Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) application for the proposed residential development municipally located at 705 Kingston Road in the City of Pickering (herein referred to as "the site" and "proposed development"). The site is bounded by Kingston Road to the north, Highway 401 to the south, Delta Boulevard to the east, and Whites Road to the west. The development proposal comprises approximately 1,830 residential units and 4,500 square metres of retail gross floor area.

Notably, the planned Durham-Scarborough Bus Rapid Transit (DBRT) system will be assumed as operational along Kingston Road for all future condition analyses.

Study Objectives

The primary objectives of the TIS are as follows:

- Describe existing conditions and the proposed development.
- Assess the required amount of parking, loading facilities, and bicycle parking to accommodate the development's transportation needs.
- Evaluate the potential traffic generation and distribution patterns resulting from the proposed development.
- Identify potential impacts on intersections and road segments within the study area.
- Develop a comprehensive Transportation Demand Management (TDM) plan aimed at promoting sustainable travel options and reducing single-occupancy vehicle trips.

Parking and Bicycle Parking Assessment

The study will assess the required amount of parking, including both standard parking and loading facilities, to adequately support the proposed development. Additionally, the demand for bicycle parking spaces will be evaluated to encourage sustainable modes of transportation.

Study Area

The study area will encompass intersections and road segments nearby the proposed development site. The specific intersections to be studied are as follows:

- Kingston Road / Whites Road
- Kingston Road / Highway 401 Westbound Ramp
- Kingston Road / Delta Boulevard
- Whites Road / Highway 401 Eastbound Off-Ramp
- Existing and future site accesses

The planned DBRT system will be assumed as operational for all future background and future total analyses. The latest preliminary designs (dated 2021) suggest two through lanes in each direction along Kingston Road, with auxiliary turning lanes and a centre-median BRT system. Additionally, cycle tracks are shown on both the north and south sides of Kingston Road. The nearest DBRT stop is planned for the intersection of Kingston Road and Whites Road, located adjacent the site.

Methodology

The TIS will utilize a comprehensive approach including the following key components:

- Collection of existing traffic data, including peak-hour traffic volumes and existing signal timing plans.
- Capacity analysis using Synchro version 11, based on the City of Pickering and Region of Durham's latest guidelines.
- Assessment of existing and future Level of Service (LOS) within the study area based on established criteria.
- Evaluation of transit, pedestrian and cyclist facilities and their integration with the proposed development.

Analysis Periods

The study will focus on the 2029 and 2034 horizon years for all study area intersections and the 2039 horizon year for all study area intersections under the jurisdiction of the Ministry of Transportation (MTO). These horizon years have been selected to account for anticipated development and growth within the area in line with other studies currently being undertaken nearby. These periods will consider short-term impacts as well as potential changes in travel behavior over the long term.

Background Traffic

Given the significant volume of development planned along Kingston Road, corridor growth in addition to specific background development traffic will not be considered. With introduction of the DBRT and anticipated modal shift away from single occupant vehicle trips, it is expected that there will be an overall reduction in vehicle traffic along Kingston Road in future during peak hours. Background traffic generated by specific area developments will be included as part of the future horizon analyses.

Data Collection

Data collection will involve a combination of field surveys and existing data sources. Turning movement counts will be conducted during peak periods to capture the full spectrum of traffic conditions where recently acquired existing data are not already available to BA Group.

Mitigation Measures

Based on the analysis, the TIS will identify potential mitigation measures, if necessary, to address identified impacts as a result of the proposed development. These measures may include signal timing adjustments, intersection geometric enhancements, and improvements to pedestrian and cyclist infrastructure.

Transportation Demand Management (TDM)

A comprehensive TDM plan will be developed as part of the study. The plan will outline strategies to promote sustainable travel options, reduce single-occupancy vehicle trips, and enhance overall transportation efficiency.

Reporting and Documentation

The final Transportation Impact Study report will include:

- Executive Summary highlighting key findings and recommendations.
- Loading, vehicle parking, and bicycle parking assessment results.
- Parking Justification Study.
- Traffic impact modeling results and assumptions.
- Detailed analysis of traffic impacts at identified intersections and road segments.
- Mitigation strategies and their potential effectiveness (if required).
- Transportation Demand Management plan measures.
- Supporting data, figures, and tables.

Agency Review

Upon completion, the report will be submitted to the City of Pickering, Region of Durham, and the MTO for review and feedback. Comments received during the review process will be taken into consideration for future submissions.

* * * * * *

We trust that this study terms of reference satisfies the City of Pickering, Regional Municipality of Durham, and Ministry of Transportation requirements for a transportation study at this location. Should you wish to discuss further with BA Group on the scope of this study, please contact the undersigned.

Sincerely,

BA Consulting Group Ltd.

Monica Miranda

cc. Steven X. Kwan P.Eng., Chris Asmanis

From:	Lynda Motschenbacher
To:	Monica Miranda
Subject:	FW: 705 Kingston Road City of Pickering - Terms of Reference [PRE 039/23]
Date:	April 8, 2024 9:08:17 AM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png

Good morning Monica,

Doug Robertson and I have reviewed the proposed Terms of Reference, and our comments are as follows:

1. Your study must comply with the Regions Traffic Impact Study Guidelines, including the requirements for Synchro analysis (Chapter 9 in the Design Specifications for Traffic Control Devices, Pavement Marking, Signage and Roadside Protection).
2. We agree that collecting new counts at the study area intersections is appropriate. If required for reference, the most current intersection turning movement counts, ATR counts and AADT data available from the Region can be downloaded from our web site through the interactive traffic counts map. Other traffic data, including signal timings, are available for purchase from our Traffic Engineering & Operations Division (traffic@durham.ca 905-666-8116).
3. As noted, the study will include a site visit, this is to include observing existing infrastructure and operations for all travel modes. Key observations are to be included in the report, including any observed operational or safety issues. Observations of existing traffic operations (e.g. queue lengths) should be used to validate the existing conditions Synchro analysis results.
4. Construction of the Durham-Scarborough BRT through the study intersections is currently expected to occur in 2025. With implementation of the median BRT, the following changes are to be incorporated in the Synchro analysis for the study intersections:
   a. Change general purpose lane configuration as needed to match the attached design plans (note that the bus only lanes are not coded into Synchro as they do not contribute to the general traffic capacity of the intersection);
   b. Change eastbound/westbound left turn operation from protected-permitted to protected only;
   c. Extend northbound/southbound all-red clearance interval to account for the additional width across Highway 2; and
   d. Extend northbound/southbound pedestrian times to account for the additional width across Highway 2.
5. Contact the City of Pickering for the most complete and up to date information on development applications.
6. Include additional information about the proposed development in the study to demonstrate that the selected ITE Trip Generation land uses are appropriate.
7. The study is to include sections on transit and active transportation to document existing and planned networks and services and provide recommendations for safe and effective connectivity to the site for non-auto travel.

8. The Travel Demand Management section of the study is to provide recommendations on infrastructure and programs to minimize travel demand and encourage non-auto travel mode use by the employees of the development. The TDM recommendations are to be site-specific, and the study is to identify who would be responsible for the initial implementation and on-going operation (as applicable) of each recommended facility or program.

Please contact myself if you have any questions on the above.

Regards,

Lynda

Lynda Motschenbacher | Senior Project Coordinator
Works Department | Transportation Infrastructure
The Regional Municipality of Durham
Lynda.Motschenbacher@durham.ca | 905-668-7711 extension 3492 |
durham.ca

From: Monica Miranda <Monica.Miranda@bagroup.com>
Sent: Friday, March 15, 2024 5:25 PM
To: Zahoor, Nadeem <nzahoor@pickering.ca>; Doug Robertson <Doug.Robertson@Durham.ca>; alexander.hajjar@ontario.ca
Cc: Steven X. Kwan <kwan@bagroup.com>; Chris Asmanis <chris.asmanis@bagroup.com>
Subject: 705 Kingston Road City of Pickering - Terms of Reference [PRE 039/23)

Hi Nadeem, Doug, and Alexander,

BA Group has been retained by the landowners of the property municipally known as 705 Kingston Road, City of Pickering (southeast corner of Kingston Road/Whites Road North) to undertake transportation consulting services in relation to a proposed mixed-use residential redevelopment. A Pre-Consultation Meeting, dated November 29, 2023, has been held with and/or circulated to the City, Region, and Ministry of Transportation for the purpose of discussing the application to facilitate the redevelopment of the property.

We have prepared a Transportation Impact Study Terms of Reference to provide a scope of work that will be completed and submitted as part of the Official Plan Amendment and Zoning By-law Amendment application.

Please find attached our proposed study terms, which considers the City and Region TIS guidelines and comments provided during the Pre-Consultation Meeting.

Thanks,

Monica Miranda
Lead Transportation Analyst

BA Consulting Group Ltd.

95 St. Clair Avenue West, Suite 1000 | Toronto
416 961 7110 x202 | Monica.Miranda@bagroup.com

BA Consulting Group Ltd.

From:	Doug Robertson
To:	Hajjar, Alexander (MTO); Monica Miranda; Zahoor, Nadeem
Cc:	Steven X. Kwan; Chris Asmanis; Brown, Francesca (MTO); Lynda Motschenbacher
Subject:	RE: 705 Kingston Road City of Pickering - Terms of Reference [PRE 039/23)
Date:	April 5, 2024 5:29:32 PM
Attachments:	image001.png image003.png image004.png image005.png image006.png image007.png image002.png

Hi Alexander,

FYI, the Region is planning to tender construction of the BRT through this area (Steeple Hill to Merritton Road) this fall for construction in 2025.

Regards,
Doug

Doug Robertson, M.A.Sc., P.Eng., PTOE | Senior Project Manager
Works Department | Transportation Infrastructure Division
The Regional Municipality of Durham | **Celebrating 50 years!**
Doug.Robertson@durham.ca | 905-668-4113 extension 3733 | durham.ca
My pronouns are he/him. | durham.ca/50years

From: Hajjar, Alexander (MTO) <Alexander.Hajjar@ontario.ca>
Sent: Friday, March 22, 2024 11:09 AM
To: Monica Miranda <Monica.Miranda@bagroup.com>; Zahoor, Nadeem <nzahoor@pickering.ca>; Doug Robertson <Doug.Robertson@Durham.ca>
Cc: Steven X. Kwan <kwan@bagroup.com>; Chris Asmanis <chris.asmanis@bagroup.com>; Brown, Francesca (MTO) <Francesca.Brown@ontario.ca>
Subject: RE: 705 Kingston Road City of Pickering - Terms of Reference [PRE 039/23)

Good Morning Nadeem,

MTO has reviewed the TOR and can offer the following comments:

In the case where little clarity on what the future may hold (in terms of land development and traffic growth rates) is proposed, MTO asks that consultants submit both a low-growth and high-growth scenario as a sensitivity test.

This analysis provides information about the impacts of both the best and worst-case scenarios. For this project, a similar approach shall be considered. It would be appropriate to request analysis without the BRT given there is no confirmed timeline for construction/operation of this infrastructure.

Best Regards,

Alexander Hajjar CET
Sr. Project Manager | Corridor Management Office - Operations
Ministry of Transportation | Ontario Public Service
437-833-9453 | alexander.hajjar@ontario.ca

Taking pride in strengthening Ontario, its places and its people

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From: Monica Miranda <Monica.Miranda@bagroup.com>
Sent: March 15, 2024 5:25 PM
To: nzahoor@pickering.ca; doug.robertson@durham.ca; Hajjar, Alexander (MTO) <Alexander.Hajjar@ontario.ca>
Cc: Steven X. Kwan <kwan@bagroup.com>; Chris Asmanis <chris.asmanis@bagroup.com>
Subject: 705 Kingston Road City of Pickering - Terms of Reference [PRE 039/23]

Hi Nadeem, Doug, and Alexander,

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We have prepared a Transportation Impact Study Terms of Reference to provide a scope of work that will be completed and submitted as part of the Official Plan Amendment and Zoning By-law Amendment application.

Please find attached our proposed study terms, which considers the City and Region TIS guidelines and comments provided during the Pre-Consultation Meeting.

Thanks,

Monica Miranda
Lead Transportation Analyst

BA Consulting Group Ltd.

95 St. Clair Avenue West, Suite 1000 | Toronto
416 961 7110 x202 | Monica.Miranda@bagroup.com

BA Consulting Group Ltd.

Appendix C:
Durham Traffic Impact Study Guidelines

The Regional Municipality of Durham

TRAFFIC IMPACT STUDY GUIDELINES

Works Department
Traffic Engineering and Operations Division
101 Consumers Drive, Box 623
Whitby, ON L1N 6A3

March 2010
Revised Oct 2011

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1. Introduction

1.1 Purpose

Traffic impact studies are primarily required to identify the impacts of new development on the public road system, on public transportation and other modes; and their mitigation through measures such as road and intersection improvements and/or the need to install or upgrade traffic control devices. In addition, traffic impact studies can assist in identifying the financial responsibility, timing for transportation system improvements and the staging of development. While the focus of these studies is on maintaining a safe and efficient road system for automobile and truck traffic, it is also important to consider other modes of transportation including public transit, cyclists and pedestrians. Therefore, recommendations emanating from a traffic impact study may also include improvements to facilities and/or services for other transport modes.

These guidelines have been developed by the Regional Municipality of Durham (the Region) to meet the following objectives:

- Provide land owners, development companies, and Consultants with an approach to preparing traffic impact studies that will meet the requirements of the Region;
- Ensure consistency in the preparation of traffic impact studies, which will facilitate thorough and expeditious reviews by the Region;
- Provide a process that forms a working partnership between the Region and the private sector in planning the technical framework for “information services” to Regional Council and the public forum; and
- Reduce the costs and delay to developers caused by confusion of the process for development approval.

1.2 Durham Region’s Role

Within Durham Region, the Region has responsibility for most arterial roads as well as traffic signals, and an interest in arterial and other roads under the jurisdiction of the local municipalities as their operation may affect the Regional roads. The Regional road system is illustrated in **Figure 1**, which shows the entire Region, and in **Figure 2**, which focuses on the denser road network serving the City of Pickering, Town of Ajax, Town of Whitby, and City of Oshawa. In addition, Durham Region Transit (DRT) has jurisdiction over the provision of transit services within the Region, and the Region also plays a significant role in transportation demand management (TDM) through its Smart Commute Durham efforts. The designated Transit Priority Network is illustrated in **Figure 3**. The Region also designates a Strategic Goods Movement Network containing preferred haul routes which are to accommodate commercial vehicles on a year round basis and link major generators of goods movement traffic as illustrated in **Figure 4**.While these maps are useful in determining the jurisdiction and functions of roads that may be directly impacted by a proposed development, the onus is on the proponent to contact all potentially affected government agencies to determine their individual requirements with respect to addressing impacts on various aspects of the transportation system.

For a development site situated on a Regional road, the Region’s Works Department is the key contact for traffic impact studies, and in conjunction with other Regional Departments, will assist in establishing the scope of a transportation impact study. As noted above, the proponent will need to consult with other government agencies such as local municipalities, Durham Region Transit (DRT), the Ministry of Transportation of Ontario (MTO), and GO Transit to confirm the full scope. The transportation facilities that are typically under the jurisdiction of the local municipalities include local and collector roads, sidewalks, trails, and cycling facilities, while the MTO has jurisdiction over the 400 series freeways and provincial highways. DRT provides public transit services within the Region, and GO Transit has jurisdiction over inter-region rail and bus transit.

With respect to pre-consultation, submission, and review of traffic impact studies, the following Regional department and/or agency structure applies:

- ***Works Department*** – primary and first point of contact for all traffic impact studies, and the key resource for traffic and collision data as well as information regarding traffic control devices;
- ***Planning Department*** – primary point of contact for all Regional and local municipal development applications, except site plan applications, and coordinates the Region's response. The Planning Department is also responsible for the Smart Commute Durham program and implementation of TDM measures within the Region. As well, the Planning Department is the key resource for travel demand model data including information such as population and employment growth, development patterns, travel demand management, and long range traffic forecasts; and
- ***Durham Region Transit*** – separate agency with specific interests in development impacts that affect transit service and/or facilities, and the key resource for local transit routing and requirements.

Following a review of a traffic impact study, the comments prepared by staff in the departments listed above are collected by the Regional Works Development Approvals branch for circulation and action.

1.3 Description of the Planning Process Relevant to Transportation

The planning process related to assessing the traffic impact of new development or redevelopment ranges from broader, longer range issues to very site specific details. The key instruments in the planning process as related to addressing potential changes in traffic requirements are described briefly below:

- ***Regional and/or Area Municipal Official Plan Amendments:*** as may be required to change land use designations to accommodate a proposed land use (e.g., re-designating lands from residential to mixed use);
- ***Re-Zoning:*** as may be required to increase the intensity or diversity of land uses on a site (e.g., altering how land may be used, where buildings and other structures can be located, the types of buildings that are permitted and how they may be used, or the lot sizes and dimensions, parking requirements, building heights and setbacks from the street);
- ***Plan of Subdivision:*** as may be required to address the details of a subdivision of land (e.g., new street connections to the public road system, locations of traffic signals, etc.); and
- ***Site Plan:*** as may be required to address the details of a specific development (e.g., driveway access design details) or Plan of Condominium.

As part of a traffic impact study, the introduction should include a description of where the development is in the planning process, and what is being applied for with respect to any changes to the existing planning regulations.

These guidelines have been developed to address traffic impact studies that focus on a particular development, and are not intended to cover the full range of activities that may be necessary for secondary planning or corridor transportation studies. The latter types of studies, which are broader and more comprehensive, are often required as part of the background work for a proposed amendment to the official plan of either an area municipality or the Region.

1.4 When is a Traffic Impact Study Required?

A Traffic Impact Study report is typically required where a proposed development may impact the transportation network, including the road, transit route, cycling and pedestrian components.
For these situations, as well as when a proposed land use is considered as-of-right, a transportation impact study is required when:

- The proposed development is anticipated to generate 100 or more vehicle peak hour trips (two-way); or
- The proposed development is anticipated to generate less than 100 vehicle peak hour trips, however, the site or study area characteristics are such that traffic or other transportation issues or concerns may have to be addressed to accommodate the development.

It is also recognized that developments may not proceed as originally planned for a variety of reasons. Should the proposed development remain dormant for two years or more, i.e., the application process has become inactive, it will be necessary to update the traffic impact study to address any changes in either the development proposal or study area transportation conditions.

1.5 Pre-Consultation

Prior to the undertaking of a traffic impact study, pre-consultation is required between the Region and the applicant's consultant. The intent of the pre-consultation is to discuss the development proposal, relevant issues pertaining to the type of development or its location, establish the scope of study required, and to confirm acceptable study parameters.

The format for pre-consultation will depend in part on the scale of the development proposal, the proposed land use and its likely traffic impacts, and may include a phone discussion, email exchange, or a meeting. A checklist of discussion items is provided in Section 3 of these guidelines to provide structure to the pre-consultation, and to serve as the basis for the requirements of a particular transportation impact study.

The Region may accept study findings and recommendations even where pre-consultation has not occurred, but omitting pre-consultation is likely to result in a need for multiple revisions, and resubmissions, which can greatly extend the review process.

1.6 Required Qualifications

As part of the pre-consultation exercise, the applicant's consultant should be prepared to demonstrate the experience and expertise that both the firm and the individual acting as project manager have in the field of transportation and traffic engineering and the preparation of traffic impact studies. In the event that the consultant lacks the prerequisite experience, the Region would require that the applicant retain a new qualified consultant, or possibly a qualified sub-consultant to assist the original consultant. The latter case would address situations where the original consultant is providing other services within their field of expertise to the applicant.

The submitted traffic impact study will include a transmittal or signature page with the signatures of the project manager and a second person responsible for quality assurance (i.e., "checked by"). If the study is prepared or reviewed by a professional engineer, the report should be stamped accordingly. For studies prepared by other professionals specializing in transportation planning, the Region will assess the need for co-signing and stamping by a professional engineer depending on several factors such as the experience and qualifications of the author of the report, the degree or scale of engineering content within the study (e.g., design drawings), and the perceived liability to the Region with respect to safeguarding of life, health, property, or the public welfare.

1.7 Responsibilities Following Region's Review of Traffic Impact Study

If it is determined through the Region's review of the traffic impact study that all transportation and traffic impacts have been properly assessed, and the recommended improvements to the transportation system will allow the development to proceed without adverse impacts, favourable comments will be provided with respect to transportation and traffic considerations for the development review and approval process.

Should the Region determine that the traffic impact study is incomplete, has significant errors, or has not properly identified the necessary improvements, the applicant's consultant will be required to:

- Address any study issues or deficiencies as identified in the Region's review; and
- Submit an addendum report identifying how the issues and deficiencies have been or are to be addressed. The addendum would require two signatures as was required for the original report.

Pending receipt and subsequent acceptance of an addendum report, favourable comment on the development proposal will be withheld by the Region.

2. Technical Component

The traffic analysis will follow the framework of the comprehensive transportation planning process which includes but may not be limited to the following tasks;

- Description of the Proposed Development
- Definition of the Study Area
- Description of Existing Conditions
- Setting a Planning Horizon and Determining Background Traffic Forecast
- Trip Generation and Modal Split assumptions
- Trip Distribution
- Trip Assignment
- Traffic Analysis
- Screenline Analysis
- Provisions for Non-auto Modes
- Community Impact Analysis – Neighbourhood Impacts, Parking Impacts, TDM
- Findings and Recommendations

2.1 Description of Development Proposal

The report title page shall include the name of the proposed development, the developer's name and the consultant's name, as well as the road and municipality where the proposed development is located.

The type and size of the proposed development shall be clearly described, including as much detail as possible on the proposed uses, number and size of buildings, etc. The current status of the development proposal within the planning process shall be noted, as well as the expected dates for construction start, full build-out, and completion of any interim phases.

The location of buildings on the site, the proposed accesses to the public road network, and the internal auto, cycling and pedestrian circulation system and amenities shall be illustrated on a site plan, which is to be included for reference as part of the traffic impact study. The site plan shall be clear, legible, and current.

With respect to traffic impact, the time periods when the development will have the greatest impact on the transportation system shall be identified as related to the nature of the proposed land use (e.g., weekday and weekend am/pm peak hour, street peak, peak of generator, etc.). This would include a description of the hours of operation, and/or considerations such as shift changes, special events, or other unique aspects of a proposed development. Other characteristics, such as higher generation of truck traffic, transit trips, pedestrian/cyclist traffic, etc., shall also be identified.

Description of proposed development and planning context
Clear, legible, and current site plan to be included in the report
Identification of critical time periods for assessing impact

2.2 Definition of the Study Area

The study area for a traffic impact study will typically vary according to the size of the proposed development, but should include the road sections and intersections, transit routes, and cycling and pedestrian facilites that will experience significantly higher traffic demands and/or impacts due to the proposed development. Therefore, pre-consultation with the Region shall be required to establish the limits of the study area including specific intersections to be included in the analysis. The traffic impact study report shall include a key map to illustrate the study area in the context of the local municipality.

Pre-Consultation required with Region to confirm study area
Key Map for report to illustrate study area

2.3 Description of Existing Conditions

The existing physical conditions in the study area shall be clearly documented through a site visit, and shall include detailed descriptions of the roadways, intersections, traffic control devices, transit, cycling and pedestrian facilities and amenities, traffic regulations (e.g., turn prohibitions, speed limits, parking restrictions, etc.), parking facilities, and adjacent land uses. The classification of study area roads shall also be provided as well as any other designation with respect to their intended function such as goods movement corridor, transit corridor, cycling spine, etc. The latter designations may be found in the Official Plans of the Region and local municipalities, or in current transportation master plans, cycling master plans, etc. To augment the descriptive text, it is recommended that site photos be taken, and selected photos should be included in the traffic impact study to assist in illustrating existing conditions.

The most recent traffic volumes available in the Region's and/or local jurisdiction's database shall be requested, and shall be supplemented by new traffic counts in the event that either the available traffic counts are more than one year old or there are no traffic counts available for a particular intersection or roadway. This will ensure that the basis for both assessing existing traffic conditions and forecasting future traffic conditions will properly reflect current traffic data for the peak periods of interest. A summary of the key traffic data and other relevant data that may be required (depending on the scope of the traffic impact study) is as follows:

- Existing and historical traffic volumes
- Pedestrian crossing volumes
- Collision records (typically three year history)
- Signal timing
- Transit routes, schedules and ridership data
- List of committed road improvements

Existing traffic operations shall also be observed and documented during the peak periods. Preferably, the observations should be carried out at the same time as the data collection. This will assist in determining if there are any unusual traffic conditions or issues within the study area, and will serve to validate the results of subsequent analyses.

The data collection activities shall be described in the traffic impact study with existing peak period traffic volumes presented clearly and legibly in figures (preferable), charts, and/or tables. The raw traffic data summaries obtained from field counts shall be provided for reference as part of the report appendix materials.

Description of physical conditions of transportation network
Current traffic data supported by observations of operations
Clear and legible presentation of traffic data

2.4 Setting a Planning Horizon and Determining Background Traffic Forecast

Background traffic refers to the traffic that would be using the study area road network regardless of whether the proposed development is built or not, and as such, provides a benchmark for the assessment of the development's impact. Prior to estimating background traffic, it is necessary to establish a horizon year(s), or design year(s), for assessing future traffic conditions and requirements. The appropriate horizon year(s) shall be determined on a case-by-case basis depending on the scale of the development, and in some cases, development phasing. This will be part of the pre-consultation with the Region.

It is recognized that a relatively short term planning horizon is used for most traffic impact studies, since the traffic assessment is usually based on detailed operational analysis methodologies, and longer range forecasts are not considered to be sufficiently precise to be analyzed in this way. Therefore, typical horizon years that shall be considered are as follows:

- "Opening day" to represent full build-out of a proposed development within one to three years of the base year (current) conditions
- Five or 10 years after full build-out to assess a relatively mature state of development in the study area
- If the development is to be phased, at build-out of each significant development phase
- Any combination of the above to reflect logical checkpoints as development progresses

The typical methods for preparing background traffic forecasts include:

- Application of growth factors based on historical traffic growth, travel demand forecasting models, population growth, etc.
- Addition of traffic that will be generated by other developments within the study area that are approved, but not constructed
- Reassignment of area traffic to reflect planned improvements to a road network such as the addition of a new road that may change travel patterns

- A combination of the above

As noted above, it may be necessary to make assumptions with respect to future road network improvements that could logically be in place by the study horizon year(s). Information pertaining to planned road network improvements shall be drawn from the capital works programs or development charges by-laws of the Region and other local jurisdictions, or from current transportation master plans or other longer range transportation planning studies. Since these information sources may give a range of years for the implementation of a planned improvement, a conservative approach shall be taken whereby it is assumed that the improvement would occur later rather than earlier in a planning period when associating it with a particular horizon year.

The acceptable methodology for estimating future background traffic shall also be discussed with the Region as part of pre-consultation. The appropriate method will be largely dependent on Study Area characteristics as well as the horizon year(s).

The background traffic forecasts for the peak hour periods for each horizon year shall be presented clearly and legibly in figures. Supporting information such as regression analysis to develop historical growth rates, travel demand model output, and assumptions used in estimating background traffic volumes shall be provided for reference as part of the report appendix materials.

Establishment of horizon year(s) for forecasting
Confirmation of background traffic forecasting methodology
Confirmation of future road network assumptions
Clear and legible presentation of background traffic forecasts

2.5 Trip Generation and Modal Split Assumptions

The number of vehicle trips that will be generated by the proposed development during the peak hour period of the adjacent or nearby arterial roads shall be estimated using generally accepted methodologies, which may vary depending on the type of development. These methodologies include:

- First principles – estimates of traffic based on anticipated site activity (e.g., number of employees) and converted into vehicle trips through the application of factors such as modal split, percentage of traffic occurring during peak hours, etc.
- Trip generation surveys of proxy developments conducted by the applicant’s consultant
- Trip rates and formulae published in the current version of the Institute of Transportation Engineers (ITE) manual, “Trip Generation”

The basic trip generation developed using the sources above shall be adjusted where appropriate to account for the following factors that affect the number of vehicle trips generated by a site or considered additional to the study area road network:

- Pass-by trips, diverted link trips, and on-site synergy between complementary land uses – according to ITE methodology, original research, or reasonable assumptions
- Modal split and TDM adjustments – according to reasonable assumptions for the study horizon year,. Reference should be made to the targets established in the Region’s Transportation Master Plan (auto reduction target) and Durham Region Transit’s Long Term Transit Strategy Study (transit mode split objectives).

The methodology and assumptions to be used in estimating peak period site trip generation shall be confirmed through pre-consultation with the Region and shall be applied in accordance with the current edition of the ITE "Trip Generation Handbook". When transit ridership is part of the growth scenario (i.e., transit station area), the trip generation shall be based on "person trip" principles before the modal split is applied.

The site trip generation shall be clearly presented in tables or charts, and supporting research or other relevant information shall be provided for reference as part of the report appendix materials.

Acceptable site trip generation methodologies – pre-consultation
Acceptable site trip generation adjustments – pre-consultation
Clear presentation of site trip generation and reference material

2.6 Trip Distribution

The distribution of the site generated trips to the study area road network shall be based on generally accepted methodologies, which may vary by the type of development and for different horizon years. As well, different methods may be applied to determine the trip distribution for primary, pass-by, and diverted link trips. These methodologies include:

- Existing traffic patterns
- I.T.E. Trip generation manual
- Origin-destination or similar travel surveys
- Market research and related study by a market consultant
- Travel demand forecasting model information related to origins/destinations for a specific traffic zone or zones
- Current Transportation Tomorrow Survey data
- Census data

The rationale for determining trip distribution shall be discussed as part of pre-consultation activities, and shall be clearly articulated in the traffic impact study. The trip distribution shall be presented clearly in tables or figures, and relevant background information shall be provided for reference as part of the report appendix materials.

Acceptable trip distribution methodologies – pre-consultation
Acceptable trip distribution variations – pre-consultation
Clear presentation of trip distribution and reference material

2.7 Trip Assignment and Total Traffic Forecasts

The assignment of the site trips to the study area road network shall combine the trip generation and distribution information with logical decision-making regarding the choice of alternative routes to/from a site. A trip assignment may be made manually or automatically generated through a travel demand model. The selected method may depend on the scale of development.

The assumptions or parameters used in undertaking the trip assignment shall be clearly articulated in the traffic study by providing the following:

- Description of the rationale for routing choices where alternatives exist
- Explanation of iterative assignments if undertaken to avoid problem traffic movements
- Separate figures that clearly illustrate primary site trips, pass-by/diverted link trips, and internal trips, as applicable

The site trip assignment, or assignments if considering a phased development, shall be summed with the corresponding background traffic forecasts to determine total traffic forecasts for each peak period and each horizon year. A separate figure shall be provided to clearly illustrate the total traffic forecast for each horizon year.

Trip generation/distribution combined with logical routings
Manual or transportation planning model site trip assignments
Site and background traffic summed for total traffic forecasts
Clear presentation of site and horizon year total traffic forecasts

2.8 Traffic Analysis

The analysis of existing and future traffic conditions shall be conducted using methodologies and software analysis tools that are accepted by the Region. This is necessary as part of ensuring that the analysis is easily understood as well as maintaining consistency in the review of traffic impact studies for development sites across the Region.

For guidance with respect to analysis, the Region has prepared several reference documents, including:

- Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection (Works Department, April 2007 – updated periodically)
- Right-Turn Lane Guideline
- Policy for Entranceways
- Arterial Corridor Guidelines (February 2007)

The analysis shall follow the methodology of the “Highway Capacity Manual” as determined by the “setting” of the proposed development. Capacity analysis and Level of Service (LOS) calculations are different for rural and urban environments. In urban areas, LOS is based on “vehicular delay” at intersections while in rural areas the LOS is based on “speed”. It is the planning policy of the Region of Durham to operate the road network in an urban setting” to a LOS “D” or better. Rural highways are expected to operate at LOS “C” or better.

The capacity analysis and LOS shall address the performance of all the proposed site entrance/exits and the regional road intersection(s) impacted for existing and future conditions for the identified analysis period. The performance of each signalized and unsignalized intersection will be tested in the following scenarios:

- Existing Conditions
- Existing Conditions + Full Development
- Future Background Conditions
- Future Background Conditions + Full Development

For certain types of development like shopping centres, a big issue can be the provision of “on-site parking” and the possibility of “overspill parking” on community residential streets. In some cases, a large mixed land use development may want a reduction in the zoning parking requirements based on “shared parking principles”. When parking supply or demand is expected to be an issue, the Consultant should discuss this aspect at the beginning of the project. The Region’s primary concern is to ensure that the parking supply/layout does not impact traffic operations on the regional roads.

In some growth areas and along some arterial roadway corridors, public transportation is a key issue. In these studies, the study framework may change. The analysis would consider the impact of changing “modal split”. In these cases, the analysis would be based on person-trip characteristics. Modal split is an issue which the Consultant should discuss at the beginning of the project.

The respective roles of the Region and the consultant in establishing the ground rules for the analysis and presenting the results of that analysis are summarized in **Table 1**.

TABLE 1
TRAFFIC OPERATIONS ANALYSIS
ROLES AND RESPONSIBILITIES

Component	Region	Consultant
Methodology and Software	Identify acceptable operational analysis techniques and software. Currently Highway Capacity Manual methodology and Synchro software are required; Identify setting; urban or rural	Consult with Region with respect to acceptable Synchro software version and/or the acceptability of using an alternative analysis tool where Synchro is not appropriate (e.g., microsimulation, etc.) In rural setting follow Highway Capacity Manual for LOS of highway
Input Parameters	Identify acceptable and/or required parameters – saturation flow, peak hour factor, heavy vehicle percentages, cycle lengths, clearance intervals, minimum phases, etc. Refer to the Region’s Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection, Section 9.	Clearly state all parameters and assumptions, and identify any changes to software default parameters or other parameters prescribed by the Region. Include software reports (as per the Region’s standards) and drawings in an appendix, with all clearly labeled for ease of reference
Queuing	Identify acceptable methodology for queue analysis. Currently Synchro and 95th percentile queue	Identify where queues would be expected to exceed available storage
Measures of Effectiveness (Level of Service – LOS; volume to capacity ratio – v/c)	Identify acceptable LOS, and provide a definition of critical movements by LOS and/or v/c where improvements are required	Clearly present analysis results in tables, charts, figures, and/or drawings. Highlight critical movements warranting improvements
Traffic Signal Justification	Identify acceptable methodology for traffic signal justification. Currently, Book 12 of the Ontario Traffic Manual, excluding the four hour justification	Clearly state assumptions and calculations as well as any deviation from accepted methodology or the rationale for using an alternative methodology. Provide calculation sheets in an appendix, clearly labeled for ease of reference.

TABLE 1 TRAFFIC OPERATIONS ANALYSIS ROLES AND RESPONSIBILITIES		
Component	**Region**	**Consultant**
Traffic Signal Operation	Provide signal timing information and identify acceptable cycle lengths, minimum timings, and phasing. Refer to the Region's Design Specifications for Traffic Control Devices, Pavement Markings, Signage and Roadside Protection, Section 9.	Conduct analysis in consideration of the Region's signal operation philosophy and guidelines.
Sight Distance	Identify acceptable reference material and methodology for sight distance requirements. Currently, TAC Geometric Design Guide for Canadian Roads	Provide references to manuals used and document field measurements, including assumed design speed, object and eye heights. Illustrate with appropriate drawings and/or photos where this will be beneficial
Collision Review	Identify collision prone locations or safety concerns, and safety performance indicators to be considered	Summarize data in tables and/or in collision diagrams, and identify patterns and likely contributing factors (if any)

Acceptable methodology and analysis software
Acceptable reference materials and/or manuals
Safety aspects related to traffic operations and road design
Provision of detailed analysis information and relevant reference material
Parking/supply and demand
Modal split analysis

2.10 Screenline Analysis

For larger scale development proposals a screenline analysis must be undertaken. Screenline analysis is a comparison of forecasted demands and lane capacities on the major road network (including freeways, arterial roads and major collector roads) connecting the site to the area transportation network. Typical lane capacities should be established based on Regional and area municipal Official Plan road classifications and the general characteristics of the roads (e.g., suburban with limited access, urban with on-street parking, etc.). Mitigation measures in the form of additional lane capacity must be identified where V/C for the screenline exceeds 0.90.

Screenline analysis should consider new capacity that is planned to occur within the horizon of the development. Planned transportation network changes are identified in the schedules of the Regional Official Plan, area municipal official plans, Regional Transportation Master Plan (TMP), area municipal TMPs where applicable, and detailed through the Region's annual Capital Budget and Four Year Forecast exercise and area municipal budgets if applicable.

Transit demands should also be considered, based on the assumed transit modal split, and transit network requirements identified. Consideration should be given to the Official Plan schedule showing the Transit Priority network and the Durham Region Long Term Transit Strategy.

Identification of Screenline deficiencies and recommended mitigation measures
Identification of Transit Demands and Transit Network Requirements

2.11 Provisions for Non-auto Modes

An assessment is required of the provisions made in the development proposal for all non-auto modes, in keeping with the policy directions established by the Regional Official Plan, Regional TMP and the Regional Cycling Plan. Consideration should also be given to DRT's Long Term Transit Strategy and the Transit Oriented Development Strategy. Elements of the proposal that support rapid and conventional transit ridership, cycling, and pedestrian movements on the study area transportation network must be identified. The method and means by which the development, as well as adjacent areas, can be efficiently and effectively serviced by transit must be determined. Pedestrian and bicycle network continuity should also be considered.

An assessment of potential impacts on transit operations must be undertaken for current transit routes and any service changes proposed by the applicant and where the site accesses connect to or cross elements of the Region's Transit Priority Networks (see refer to the Regional Official Plan and the Long Term Transit Strategy). The assessment will identify the potential for increased delay to transit vehicles, safety concerns/conflicts with transit vehicles, and any impacts on stations or stops.

Gaps in pedestrian and cycling network continuity, due to missing infrastructure or as a result of winter maintenance, should be identified. That is, the Consultant should note where obvious gaps in the networks would exist as a result of the site pedestrian and cycling facilities not connecting or being accessible or having access to pedestrian and/or cycling facilities on the existing transportation network. Identification of these gaps will assist local municipal and Regional staff in approving development related transportation infrastructure and/or prioritizing their own programs for pedestrian and cycling facility construction and maintenance.

A detailed assessment of pedestrian facility level of service will be required in the vicinity of the site where the development is expected to produce high pedestrian volumes. Additional sidewalk or facility width may be required in such circumstances.

Assessment of Non-auto modes
Potential impacts on Transit Operations
Gaps in pedestrian and cycling infrastructure
Assessment of Pedestrian Facility Level of Service

2.12 Community Impact Analysis

Neighbourhood Impacts

The traffic impact study will review the transportation network in the vicinity of the proposed development and identify potential neighbourhood infiltration routes. Focusing on these routes in the study area, the report will identify site-related traffic impacts on potentially affected neighbourhood streets during both the commuter peak and the projected site peak and an appropriate mitigation strategy, where one is required.

Parking Impacts

For developments that generate significant auto parking demand the traffic impact study will review the site-generated parking demand and will demonstrate an appropriate parking strategy for the development.

Transportation Demand Management

A goal of the Region's Official Plan is to reduce peak hour travel demand, reduce auto dependency, increase vehicle occupancy, encourage linked trips and encourage other modes of travel as part of Travel Demand Management (TDM). Any reductions in vehicle trip generation based on TDM must be clearly explained with reference material as part of a "person-trip" analysis of the development scenario. A Travel Options plan will be required on certain developments determined by the Region. The Travel Options plan will identify recommended TDM measures, links to Region's TDM initiatives (e.g. Smart Commute Durham), and mechanisms for integrating the proposed development into the existing services and programs. The Region's Planning Department will be available to assist in developing a TDM plan.

Identification of potential neighbourhood infiltration routes and mitigation measures
Parking Management Strategy
Transportation Demand Management plan

2.13 Findings and Recommendations

The translation or interpretation of the results of the traffic analysis into recommended road and traffic control improvements and requirements shall reflect the Region's practices and policies. In addition to the reference documents outlined in the previous section, the Regional Official Plan contains transportation policies and schedules, which should also be referenced as required with respect to road classifications, future transportation improvements (e.g., new road links, transit spines, interchanges, cycling and walking facilities, etc.), and descriptions of the functions and characteristics of the regional road network.

Other reference documents are also used by the Region including the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads and the various "Books" of the Ontario Traffic Manual published by the Ministry of Transportation of Ontario.

The respective roles of the Region and the consultant in identifying required improvements and related mitigation measures are summarized in **Table 2**.

TABLE 2 TRANSPORTATION IMPROVEMENTS ROLES AND RESPONSIBILITIES		
Component	**Region**	**Consultant**
Improvements (General)	Confirm methodology for assessing improvements required as a result of background traffic growth versus those required due to the proposed addition of site traffic	Identify any existing deficiencies and improvement measures. Clearly identify traffic impacts associated with each of background and total traffic, as well as the required mitigation measures and timing for implementation. Demonstrate that the recommended improvements will address the impacts.
Roads/Intersections	Identify the acceptable design standards/guidelines for recommended improvements, design speed(s) to be applied and the required level of supporting graphics or drawings. Currently, Region's Design Specifications manual and TAC Geometric Design Guide for Canadian Roads	Present improvement measures in tables, schematic figures, functional plans, or preliminary design plans – i.e., at a level sufficient to confirm feasibility and satisfy the Region's requirements. Where applicable, provide references to guidelines and/or standards used.
Traffic Signals	Identify traffic signal spacing requirements and potentially related requirements for progression analysis/signal coordination.	Where required, conduct appropriate analyses to demonstrate feasibility of changes to signal operations or additional traffic signals
Access Management	Identify acceptable reference material for access management policies and guidelines pertaining to Regional roads. Currently, the Region's Official Plan, Arterial Corridor Guidelines and Policy for Entranceways and TAC Geometric Design Guide for Canadian Roads	Clearly identify access management measures that may be required to mitigate safety or operational concerns. Identify where access plans comply or don't comply with the Region's policies and guidelines, and the rationale for non-compliance
Active Transportation and Public Transit	Provide the contact information for staff of Durham Region, Durham Region Transit, and other agencies with an interest in these modes	Identify deficiencies and recommend improvement measures related to walking, cycling, and/or transit modes.
Transportation Demand Management	Provide contact information for staff in the Planning Department, Transportation Planning and Research section. Planning Department will identify the need for Travel Options plans.	Identify appropriate TDM measures and the development of site-specific Travel Options plans.
Funding/Cost Estimates	Identify/confirm the improvements that will be the financial responsibility of either the Region or the development proponent. Provide guidance with respect to unit costs for road and traffic control improvement measures.	Where required, provide preliminary cost estimates for proposed transportation improvements.

Improvements required for existing, background and total traffic
Feasibility of improvements and compliance with policies and guidelines

Clear presentation of required improvements
Consideration of cost estimates and funding

2.14 Reporting

It is critical to the timing and efficiency of the Region's review that the traffic impact study be clearly and legibly documented in a report. Pre-submission quality control measures should include thorough checking of technical content and calculations, as well as proof-reading for errors in spelling and grammar. Failing to provide a report that meets the intent of the Region's guidelines will result in the report being returned to the consultant to address deficiencies prior to re-submission.

The specific requirements for reporting are as follows:

- Five hard copies of the report and technical appendices
- One electronic file (pdf of report and technical appendices)
- Signature page to indicate the persons responsible for preparing and reviewing the report
- Table of contents to generally follow the organization of the TIS Guidelines
- Key maps, tables, graphs, and figures to be placed within the report adjacent to the relevant text, rather than in an appendix
- Synchro analysis files to be made available upon request

As discussed in the Introduction, the traffic impact study will be considered to have a "shelf life" of two years if the development application is dormant. If the application is to be reconsidered after this two year period, an updated report or addendum will be required to address any changes to the development proposal and/or the transportation system.

It is noted that the Region may at their discretion engage the services of another consultant to peer review a traffic impact study. In this event, the Region will notify the development proponent and their consultant in advance.

Clear documentation essential to expedient review
Five hard copies and pdf file for report and technical appendices
Shelf life of two years if project is dormant in the planning process

3. Traffic Impact Study Guidelines Checklist

A checklist is provided below as a framework for both the Region and Consultant to follow at the key stages of a traffic impact study. The purpose of the checklist at each stage is as follows:

- ***Initiation:*** to guide the pre-consultation discussion between the Region and Consultant, and establish and confirm the required scope of work
- ***Preparation:*** to ensure completeness and facilitate quality control by the Consultant
- ***Submission:*** to ensure a comprehensive and expeditious review by the Region

Number	Item	Comments
Pre-Study		
1	Pre-Consultation	
2	Planning Process	
	▪ Official Plan Amendment	
	▪ Re-Zoning	
	▪ Site Plan	
3	Traffic Impact Study Required?	
	▪ Peak hour trip generation > 100 trips	
	▪ Site or area traffic issues	
4	Consultant Qualifications and Experience	
Study Parameters		
1	Study Area	
2	Data Requirements	
	▪ Establish peak periods for study	
	▪ Regional traffic data	
	▪ Regional signal timing information	
	▪ Regional collision data	
	▪ Regional transit information	
	▪ Traffic data collection required	
	▪ Traffic observations required	
3	Background Traffic Forecast	
	▪ Horizon year(s) ▪ Future road network	
	▪ Methodology	
4	Site Trip Generation and Modal Split Assumptions	
	▪ ITE land use code(s) and trip rates	
	▪ Proxy site data collection	
	▪ First principles	
	▪ Modal split adjustment	
	▪ Pass-by/diverted link adjustments	
	▪ Development phases	
5	Site Trip Distribution	
	▪ Existing travel patterns	
	▪ Travel survey information (e.g., TTS)	
	▪ Travel demand forecast model	
	▪ Market study	
6	Site Trip Assignment and Total Traffic Forecasts	
	▪ Methodology	
7	Traffic Analysis	
	▪ Reference: Works Department Design Specifications for Traffic Control Devices, Pavement Markings, Signage, and Roadside Protection	
	▪ Synchro software	

Number	Item	Comments
	▪ Signal timing parameters	
	▪ Synchro inputs/defaults	
	▪ Signal spacing	
	▪ Signal justification (OTM Book 12, exclude 4 hour justification)	
	▪ Acceptable LOS	
	▪ Critical v/c ratio	
	▪ Queue analysis required	
	▪ Auxiliary turn lane warrants	
	▪ Decision sight distance • On-site parking supply/demand	
9	Screenline Analysis …	
10	Provisions for Non-auto Modes …	
11	Community Impact Analysis … • Neighbourhood Impacts • Parking impacts • Transportation Demand Management • Travel Options Plan	
12	Findings and Recommendations	
	▪ Regional entranceway policies	
	▪ Regional access management guidelines	
	▪ TAC guidelines for geometric design	
	▪ Acceptable design speed	
13	Reporting	
	▪ Number of hard copies (3)	
	▪ PDF requirements (1 or more files)	

4. Traffic Impact Study Guide User Comments

A goal of the Traffic Impact Study Guidelines are to provide the "users" in the transportation industry an easy to use document loaded with information that will aid decision-makers in their understanding of the project impacts in order to allow a particular development to proceed in the development approval process..

We encourage all users of the guidelines to contact the Region if there is any confusion or misunderstanding in the document during the initial years of use so that changes can be made over time.

All comments received will remain confidential. The sender will receive a response from the Region regarding the comments and their application to the guide. Please send any comments to:

Traffic Engineering and Operations Division
Regional Municipality of Durham
101 Consumers Drive
P.O. Box 623
Whitby, ON
L1N 6A3
Phone 905-666-8116

Appendix D:
Reduced Scale Architectural Plans

BDP.
Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
t 416 598 1240   www.bdpquadrangle.com

705 Kingston Road, Pickering

Ontario, Canada

for
Resident

Project No. 21057
Date 31 OCTOBER 2024
Issued for REZONING APPLICATION

ARCHITECTURAL DRAWINGS

PLANNING CONSULTANT

The Biglieri Group
2472 Kingston Road
Toronto, ON, M1N 1V3
T: 416.693.9155

CIVIL ENGINEER

Counterpoint Engineering
8395 Jane Street,
Suite 100
Vaughan, ON, L4K 5Y2
T: 905.326.1404

LANDSCAPE ARCHITECT

MHBC
7050 Weston Road
Woodbridge, ON, L4L 8G7
T: 905.761.5588

TRAFFIC CONSULTANT

BA Consulting Group Ltd.
95 St. Clair Ave. W
Suite 1000
Toronto, ON, M4V 1N6
T: 416.961.7110

WIND CONSULTANTS

Gnobi Consulting Inc.
N/A
Guelph, ON
T: 226 343 0728

GEOTHERMAL & ENVIRON-MENTAL ENGINEER

Grounded Engineering Inc.
12 Banigan Drive
Toronto, ON M4H 1E9
T: 647.264.7909

NOISE & VIBRATION CONSULTANT

Dillon Consulting Ltd.
111 Farquhar Street
Suite 301
Guelph, ON N1H 3N4
T: 519.571.9833

NORTH

Context Plan - NTS

PROJECT STATISTICS SUMMARY	
Municipal Address: 705 Kingston Road, Pickering, ON	
	(sm)
Gross Site Area	27,316
Net Site Area (Gross Site Area -Public Road - Parkland)	24,019
Parkland Area	2,193
Zoning By-law = City Centre By-law 7553/17	
	(m)
Established Grade = (Average elevation of Cul-De-Sac as entry onto site)	98
Building 1 Height (Storeys): (excl. Mech Penthouse)	28
Building 2 Height (Storeys): (excl. Mech Penthouse)	31
Building 3 Height (Storeys): (excl. Mech Penthouse)	35
Building 4 Height (Storeys): (excl. Mech Penthouse)	35
Building 5 Height (Storeys): (excl. Mech Penthouse)	35
Building 1 Height (m): (excl. Mech Penthouse)	96.12
Building 2 Height (m): (excl. Mech Penthouse)	104.97
Building 3 Height (m): (excl. Mech Penthouse)	116.77
Building 4 Height (m): (excl. Mech Penthouse)	116.77
Building 5 Height (m): (excl. Mech Penthouse)	116.77
	(sm)
GFA - Residential Uses (less required Amenity)	116,199
GFA - Retail Uses	3,922
Total GFA (less required Amenity)	120,121
Floor Space Index (FSI)	5.00
Residential FSI	4.84
Number of Residential Suites	1,748
	(sm)
Total Residential Interior Amenity Space Provided	3,149
Total Residential Exterior Amenity Space Provided	6,648
Vehicular Parking Provided: Long-Term Residential	1,138
Vehicular Parking Provided: Combined Visitor & Retail	350
Vehicular Parking Provided: Total	1,488
Bicycle Parking Total Required	1054
Bicycle Parking Total Provided	1056
Total Loading Spaces Provided	5

Statistics Summary

GREEN ROOF STATISTICS		
GENERAL PROJECT DESCRIPTION		PROPOSED
TOTAL GROSS FLOOR AREA		120,121 m²
AVAILABLE ROOF SPACE CALCULATION		PROPOSED
TOTAL ROOF AREA (m²)		9,078 m²
AREA OF RESIDENTIAL PRIVATE TERRACES (m²)		308 m²
ROOFTOP OUTDOOR AMENITY SPACE, IF IN A RESIDENTIAL BUILDING (m²)		1,644 m²
AREA OF RENEWABLE ENERGY DEVICES (m²)		TBD
TOWER(S) ROOF AREA WITH FLOOR PLATE NOT EXCEEDING 750 m²		3,750
TOTAL AVAILABLE ROOF SPACE (m²)		3,376 m²
GREEN ROOF COVERAGE	REQUIRED	PROPOSED
COVERAGE OF AVAILABLE ROOF SPACE (m²)	1,688 m²	1,688 m² *
COVERAGE OF AVAILABLE ROOF SPACE (%)	50.0 %	50.0 % *

*EXACT DIVISION BETWEEN ROOFTOP GREEN ROOF AND REGULAR LANDSCAPE TO BE DEFINED FURTHER IN FUTURE SUBMISSIONS, MINIMUM REQUIRED AREA WILL BE PROVIDED

Green Roof Statistics

RESIDENTIAL BUILDING ACCESSIBILITY CHECKLIST		
	ITEM	DRAWINGS
1.0	SITE PLAN	
1.1	Sidewalks min. 1500mm wide (DOPS)	A101, A201, A152
1.2	Parking according to DOPS - Type A - min. 3400mm, Access Aisle - min. 1500mm	A151, A152, A153, A201, A202
1.3	Passenger Loading Zone (min. 2440mm x 7400mm), overhead clearance min. 3600mm AFF	A101, A152, A201
1.4	Curb ramps min. 1500mm wide + flared sides, TAIS	Refer to Landscape dwgs.
1.5	Overhead clearance min. 1980mm AFF	A101, A152, A201, A400 series
1.6	Path - stable, firm, slip-resistant	Refer to Landscape dwgs.
1.7	Min. 1100mm path of travel (min. 1800mm x 1800mm layby space every 30m)	A101, A152, A201
2.0	Parking Levels	
2.1	Overhead clearance from parking entrance to accessible parking min. 2100mm AFF	A151, A152, A153, A201, A202, A450 series
2.2	Accessible parking spaces	A151, A152, A153, A201, A202
2.3	Signage at accessible parking spaces (ISA)	Traffic consultant to provide signage in future submissions
2.4	Access aisles	A151, A152, A153, A201, A202
2.5	Curb ramps where level change max. 200mm or less	N/A
2.6	Accessible entrance into building	A151, A152, A153, A201, A202
2.7	Vestibule min. 1500mm (doors in series), min. 1500mm turning circle (un-aligned doors)	A151, A152, A153, A201, A202
2.8	Served by a passenger elevator	A151, A152, A153, A201, A202
3.0	Building Entrance	
3.1	Barrier-free entrances to satisfy the OBC	A151, A152, A153, A201, A202
3.2	Door clear width min. 860mm	A151, A152, A153, A201, A202
3.3	Designated barrier-free leaf (where multiple doors)	N/A AT THIS STAGE
3.4	Accessible door hardware (lever style handles, D or U-shaped handles)	N/A AT THIS STAGE
3.5	Power door operator (min. 900mm - max. 1100mm AFF); min. 600mm - max.1500mm from door swing where door swings towards control / Proximity scanning devices	N/A AT THIS STAGE
3.6	Vestibule min. 1500mm (doors in series), min. 1500mm turning circle (un-aligned doors)	A151, A152, A153, A201, A202
3.7	Accessible door threshold (max. 13mm)	N/A AT THIS STAGE
3.8	Signage incorporating the International Symbol of Access (ISA)	N/A AT THIS STAGE
3.9	Min. 1100mm path of travel	A151, A152, A153, A201, A202
4.0	Amenity Spaces	
4.1	Power door operator (min. 900mm - max. 1100mm AFF); min. 600mm - max.1500mm from door swing where door swings towards control / Proximity scanning devices	N/A AT THIS STAGE
4.2	Accessible washroom (multi-stall with barrier-free stall)	N/A AT THIS STAGE
4.3	Universal Washroom	N/A AT THIS STAGE
5.0	Barrier-Free Suites	
5.1	Barrier-free path of travel to one washroom	N/A AT THIS STAGE
5.2	Barrier-free path of travel to one bedroom	N/A AT THIS STAGE
5.3	Barrier-free path of travel to kitchen space	N/A AT THIS STAGE
5.4	Barrier-free path of travel to living room space	N/A AT THIS STAGE
5.5	Level floor area at doors	A201-A204
5.6	Barrier-free washroom min. 1500mm turning circle and wall reinforcement	N/A AT THIS STAGE
6.0	General Requirements for All Spaces and Common Corridors	
6.1	Door clear width min. 860mm	A151 - A206
6.2	Latch-side clearance min. 600mm (pull side), min. 300mm (push side)	A151 - A206
6.3	Level floor area at door, 1100mm x 1500mm space	A151 - A206
6.4	Power door operator provided where latch-side clearance is not met	N/A AT THIS STAGE
6.5	Min. 1100mm path of travel	A151 - A206
6.6	Min. 1800mm x 1800mm layby space every 30m where applicable	A151 - A206
6.7	Ramp max. slope 1 in 12 (8.3%), 1670mm x 1670mm landings, demarcation of edge	Refer to Landscape dwgs.
6.8	Vestibule min. 1500mm (doors in series), min. 1500mm turning circle (un-aligned doors)	A151 - A206
6.9	TAI's at the top of all stairs and landings served by a door	A151 - A206
6.10	Finishes with no glare, min. 70% tonal contrast between wall and door	N/A AT THIS STAGE
6.11	Wall reinforcement in main bathrooms in all suites (per A-3.8.2.1 (6))	N/A AT THIS STAGE
6.12	Doors widths within a non-BF suite (per 3.8.3.3 (2))	N/A AT THIS STAGE

Accessibility Checklist

BUILDING 1 — 28 STOREY TOWER w/ 4 STOREY PODIUM

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
MPH	430	1	430	4,629	430	0	0									
Level 6-28	750	23	17,250	185,679	1,242	16,008	172,310			0	46	115	69	0	23	253
Level 5	1,375	1	1,375	14,801	55	1,320	14,208									
Level 2-4	1,400	3	4,200	45,209	210	3,990	42,948			0	6	36	12	3	6	63
Ground Floor	1,485	1	1,485	15,985	80	379	4,080	1,106	11,896							
Building 1 Total		28	24,740	266,301		21,697	233,547	1,106	11,896	0	52	151	81	3	29	316
BUILDING HEIGHT			Interior amenity deduction (2*units) =			632	6,803			0.0%	16.5%	47.8%	25.6%	0.9%	9.2%	
Building Height	96.12 m							Saleable Areas (sf)		0	25,314	87,132	55,458	2,298	26,092	196,294
Height To top of MPH Roof	102.12 m		RGFA =	21,065 sm		226,744 sf		Average Unit Area (sf)		0	487	577	685	766	900	
			NRGFA =	1,106 sm		11,896 sf		Required Barrier Free Units		0	31		13		5	49
			Total =	22,171.0 sm		238,640 sf										

BUILDING 2 — 31 STOREY TOWER w/ 4 STOREY PODIUM

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
MPH	430	1	430	4,629	430	0	0									0
Level 6-31	750	26	19,500	209,898	1,534	17,966	193,386			26	52	104	52	26	26	286
Level 5	750	1	750	8,073	56	694	7,470									0
Level 2-4	2,100	3	6,300	67,813	213	6,087	65,520			3	3	30	39	6	9	90
Ground Floor	2,045	1	2,045	22,012	109	150	1,615	1,683	18,106							0
Building 1 Total		31	29,025	312,425		24,897	267,991	1,683	18,106	29	55	134	91	32	35	376
BUILDING HEIGHT			Interior amenity deduction (2*units) =			752	8,095			7.7%	14.6%	35.6%	24.2%	8.5%	9.3%	
Building Height	104.97 m							Saleable Areas (sf)		10,563	26,866	76,345	62,153	26,312	31,486	233,725
Height To top of MPH Roof	110.97 m		RGFA =	24,145 sm		259,897 sf		Average Unit Area (sf)		364	488	570	683	822	900	
			NRGFA =	1,683 sm		18,106 sf		Required Barrier Free Units		5	29		19		6	59
			Total =	25,828.0 sm		278,003 sf										

BUILDING 3 — 35 STOREY (excl. 5-ST PODIUM)

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
Mech PH	430	1	430	4,629	430	0	0									
Level 6-35	750	30	22,500	242,190	1,680	20,820	224,106			30	90	60	90	30	30	330
Level 5	750	1	750	8,073	62	688	7,406									0
Building 3 Total		31	23,680.0	254,892		21,508	231,512	0	0	30	90	60	90	30	30	330
BUILDING HEIGHT			Interior amenity deduction (2*units) =			660	7,104			9.1%	27.3%	18.2%	27.3%	9%	9.1%	
Building Height (incl. podium)	116.77 m							Saleable Areas (sf)		11,730	46,050	33,240	61,050	26,040	27,120	205,230
Height To top of MPH Roof	122.77 m		RGFA =	20,848 sm		224,408 sf		Average Unit Area (sf)		0	512	554	678	868	904	
			NRGFA =	0 sm		0 sf		Required Barrier Free Units		5	23		18		5	51
			Total =	20,848.0 sm		224,408 sf										

BUILDING 4 — 35 STOREY (excl. 5-ST PODIUM)

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
Mech PH	430	1	430	4,629	430	0	0									
Level 6-35	750	30	22,500	242,190	1,680	20,820	224,106			30	90	60	90	30	30	330
Level 5	750	1	750	8,073	82	668	7,190									0
Building 4 Total		31	23,680.0	254,892		21,488	231,297	0	0	30	90	60	90	30	30	330
BUILDING HEIGHT			Interior amenity deduction (2*units) =			660	7,104			9.1%	27.3%	18.2%	27.3%	9%	9.1%	
Building Height (incl. podium)	116.77 m							Saleable Areas (sf)		11,730	46,050	33,240	61,050	26,040	27,120	205,230
Height To top of MPH Roof	122.77 m		RGFA =	20,828 sm		224,193 sf		Average Unit Area (sf)		0	512	554	678	868	904	
			NRGFA =	0 sm		0 sf		Required Barrier Free Units		5	23		18		5	51
			Total =	20,828.0 sm		224,193 sf										

BUILDING 5 — 35 STOREY (excl. 5-ST PODIUM)

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
Mech PH	430	1	430	4,629	430	0	0									
Level 6-35	750	30	22,500	242,190	1,680	20,820	224,106			30	90	60	90	30	30	330
Level 5	750	1	750	8,073	101	649	6,986									0
Building 5 Total		31	23,680.0	254,892		21,469	231,092	0	0	30	90	60	90	30	30	330
BUILDING HEIGHT			Interior amenity deduction (2*units) =			660	7,104			9.1%	27.3%	18.2%	27.3%	9%	9.1%	
Building Height (incl. podium)	116.77 m							Saleable Areas (sf)		11,730	46,050	33,240	61,050	26,040	27,120	205,230
Height To top of MPH Roof	122.77 m		RGFA =	20,809 sm		223,988 sf		Average Unit Area (sf)		0	512	554	678	868	904	
			NRGFA =	0 sm		0 sf		Required Barrier Free Units		5	23		18		5	51
			Total =	20,809.0 sm		223,988 sf										

4-ST SHARED PODIUM & SITE PARKING LEVELS

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	Exemptions	City Centre By-law 7553/17 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	B	1B	1B+D	2B	2B+D	3B	Total Suites
Buildings 3/4/5: Level 2-4	5,690	3	17,070.0	183,741	12,402	4,668	50,246	0	0	9	36	3	6	0	6	60
Buildings 3/4/5: Ground Floor	5,550	1	5,550.0	59,740	4,000	1,550	16,684	0	0	0	0	3	2	0	1	6
Level B1	8,850	1	8,850.0	95,261	8,250	600	6,458	0	0							
Level B2	16,175	1	16,175.0	174,108	13,224	1,818	19,568	1,133	12,197							
Level P1	18,760	1	18,760.0	201,933	18,760	0	0	0	0							
Podium & Parking Total	Above Grade	4	66,405.0	714,783		8,636	92,957	1,133	12,197	9	36	6	8	0	7	66
	Below Grade	3	Interior amenity deduction (2*units) =			132	1,421			13.6%	54.5%	9.1%	12.1%	0%	10.6%	
								Saleable Areas (sf)		1,356	3,150	3,731	4,834	0	6,010	19,081
			RGFA =	8,504 sm		91,536 sf		Average Unit Area (sf)		452	525	622	690	0	859	
			NRGFA =	1,133 sm		12,197 sf		Required Barrier Free Units		2	7		2		2	13
			Total =	9,637.0 sm		103,733 sf										

STATISTICS SUMMARY

TOTAL DEVELOPMENT

	TOTAL NEW RESIDENTIAL GFA	sm	sf	TOTAL NEW RETAIL GFA	sm	sf	TOTAL UNIT NUMBER	
NORTH	BUILDING 1 =	21,065	226,744	BUILDING 1 =	1,106	11,896	BUILDING 1 =	316
	BUILDING 2 =	24,145	259,897	BUILDING 2 =	1,683	18,106	BUILDING 2 =	376
SOUTH	BUILDING 3=	20,848	224,408	BUILDING 3=	0	0	BUILDING 3=	330
	BUILDING 4=	20,828	224,193	BUILDING 4=	0	0	BUILDING 4=	330
	BUILDING 5=	20,809	223,988	BUILDING 5=	0	0	BUILDING 5=	330
	PODIUM=	6,086	65,510	PODIUM=	0	0	PODIUM=	66
SHARED	P1/B1/B2=	2,418	26,026	P1/B1/B2=	1,133	12,197		
	TOTAL GFA =	116,199	1,250,765	TOTAL GFA =	3,922	42,199	TOTAL =	1,748

FSI

Total Residential GFA= 116,199 sm 1,250,765 sf	FSI Calculation	Parkland Calculation	Landscape Coverage (Gross Site Area)	
Total Retail GFA= 3,922 sm 42,199 sf	Gross Site Area = 27,316 sm	MTO Lands = 4,310 sm	Total	8,061 sm
Total GFA= 120,121 sm 1,292,964 sf	Public Road Conveyance = 1,104 sm	Net Site Area for Parkland = (Gross Site Area -Public Road - MTO) 21,902 sm		29.51%
	Net Site Area for FSI = (Gross Site Area -Public Road - Parkland) 24,019 sm	Min. Parkland - 10% Net Site Area = 2,191 sm	LOT COVERAGE (Gross Site Area)	
	FSI = Total GFA/NSA 5.00	Parkland Provided = 2,193 sm	Total	8,850 sm
				32.40%

PARKING

Unit Type	Unit Count	Unit %	Level	Combined Vis. & Retail	Long Term Residential	Combined Vis. & Retail	Long Term Residential	Net Parking Space Ratio	Accessible Parking Provided		Required (Per Traffic Consultant)	Building	Level	Number
Bachelor	128	7%	Level 4		122	0.20	0.65	0.85	Level 4	0		Building 1	Ground	2 (surface lot)
1B	884	51%	Level 3		121				Level 3	0				
2B	575	33%	Level 2		120				Level 2	0		Building 2	Ground	2 (surface lot)
3B	161	9%	Ground Floor	138	104				Ground Floor	3				
			Level B1	65	92				Level B1	0		Building 3	Ground	2 (surface lot)
			Level B2	147	119				Level B2	8				
			Level P1	0	460				Level P1	8		Building 4	B2	Circular Drop-off
												Building 5	B2	Circular Drop-off
TOTAL	1,748 units		SITE TOTAL	350	1,138				TOTAL	19	19			

(Unit Mix; Parking Provided; Accessible Parking (included in the total); Additional Temporary PUDO Spaces (Not included in parking count))

AMENITY

Building	Unit Count	Location	Amenity Provided Indoor (sm)	Amenity Provided Outdoor (sm)	Total Indoor (sm)	Total Outdoor (sm)	Ratio Indoor (sm/unit)	Ratio Outdoor	Ratio Combined
Building 1	316	Level 5	547	164	634	1,274	2.01	4.03	6.04
		Ground	87						
		Balconies		1,110					
Building 2	376	Level 5	564	471	564	1,828	1.50	4.86	6.36
		Balconies		1,357					
Buildings 3, 4 & 5	1,056	Level 5	1,640	1,010	2,585	4,820	2.45	4.56	7.01
Including 4-ST Podium		Ground	530						
		B2	414						
		Balconies		3,810					
SITE TOTAL	1,432				3,149	6,648	2.20	4.64	6.84

BICYCLE PARKING

	UNITS/GFA	Min. Rate	Required	Provided
Residential				
Long-Term	1,748 units	0.5 / Unit	874	876
Short-Term	1,748 units	0.1 / Unit	174	174
Retail				
Long-Term	3,922 sm	1 / 1,000 sm	4	4
Short-Term	3,922 sm	1 rack	1	2
Total Bike Provision				
Long-Term	880		Total	1,056
Short-Term	176			
Long-Term Residential Electric Bike Provision				
Bikes	876	15%	131	131

Date	No.	Description

REVISION RECORD

31-08-2024 Issued for Rezoning

ISSUE RECORD

BDP. Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
t 416 598 1240 www.bdpquadrangle.com

705 Kingston Road, Pickering

Ontario, Canada

for
Resident

21057 N/A
PROJECT SCALE

MT YA
DRAWN REVIEWED

Statistics & Context Plan

A001.S

SITE PLAN LEGEND

- PROPERTY LINE
- MAIN BUILDING ENTRANCE
- RETAIL ENTRANCE
- EXIT
- VEHICLE / LOADING ENTRANCE / EXIT
- FIRE HYDRANT
- SIAMESE CONNECTION

Surveyor's Certificate

PLAN OF SURVEY WITH TOPOGRAPHY OF
PART OF LOT 28
RANGE 3, BROKEN FRONT CONCESSION
CITY OF PICKERING
REGIONAL MUNICIPALITY OF DURHAM

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
2022

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM THE CITY OF PICKERING BENCHMARK No. 00820188082.
LOCATION :
A BRASS CAP FLUSH IN CONCRETE LOCATED ON THE CONCRETE BOX CULVERT, NORTH OF HWY 401 IN PICKERING. IT IS NORTHWEST ON RAMP ONTO HWY 401 FROM KINGSTON ROAD, 150.0m EAST OF MICHAEL BOYER CHEVROLET LIMITED.
ELEVATION: (DATUM: CGVD28:78)
PUBLISHED ELEVATION = 94.830 metres.

BEARING NOTE

BEARINGS SHOWN HEREON ARE UTM GRID AND ARE REFERRED TO THE NORTHERLY LIMIT OF PART 1 AS SHOWN ON PLAN DR1379833, HAVING A BEARING OF N43°30'25"E.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON

DATE : ____ D. A. WILTON
ONTARIO LAND SURVEYOR

SPEIGHT, VAN NOSTRAND & GIBSON LIMITED
ONTARIO LAND SURVEYORS
750 OAKDALE ROAD, Units 65 & 66
TORONTO, ONTARIO M3N 2Z4
TEL. 416 749-SVNG(7864) FAX 416 749-7866
E-MAIL: toronto@vg.on.ca

DRAWN :	F. P. B./M. M.	FILE NAME :	A2200094.DWG
CHECKED :	D. A. W.	PLOT SCALE :	MET. 1=0.40
JOB No. :	220-0094	PLOTTED :	
REF. No. :		UPDATED :	

Date	No.	Description

REVISION RECORD

31-08-2024		Issued for Rezoning

ISSUE RECORD

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705 Kingston Road, Pickering
Ontario, Canada
for
Resident

21057	1:400	MT	YA
PROJECT	SCALE	DRAWN	REVIEWED

Site Plan

A101.S

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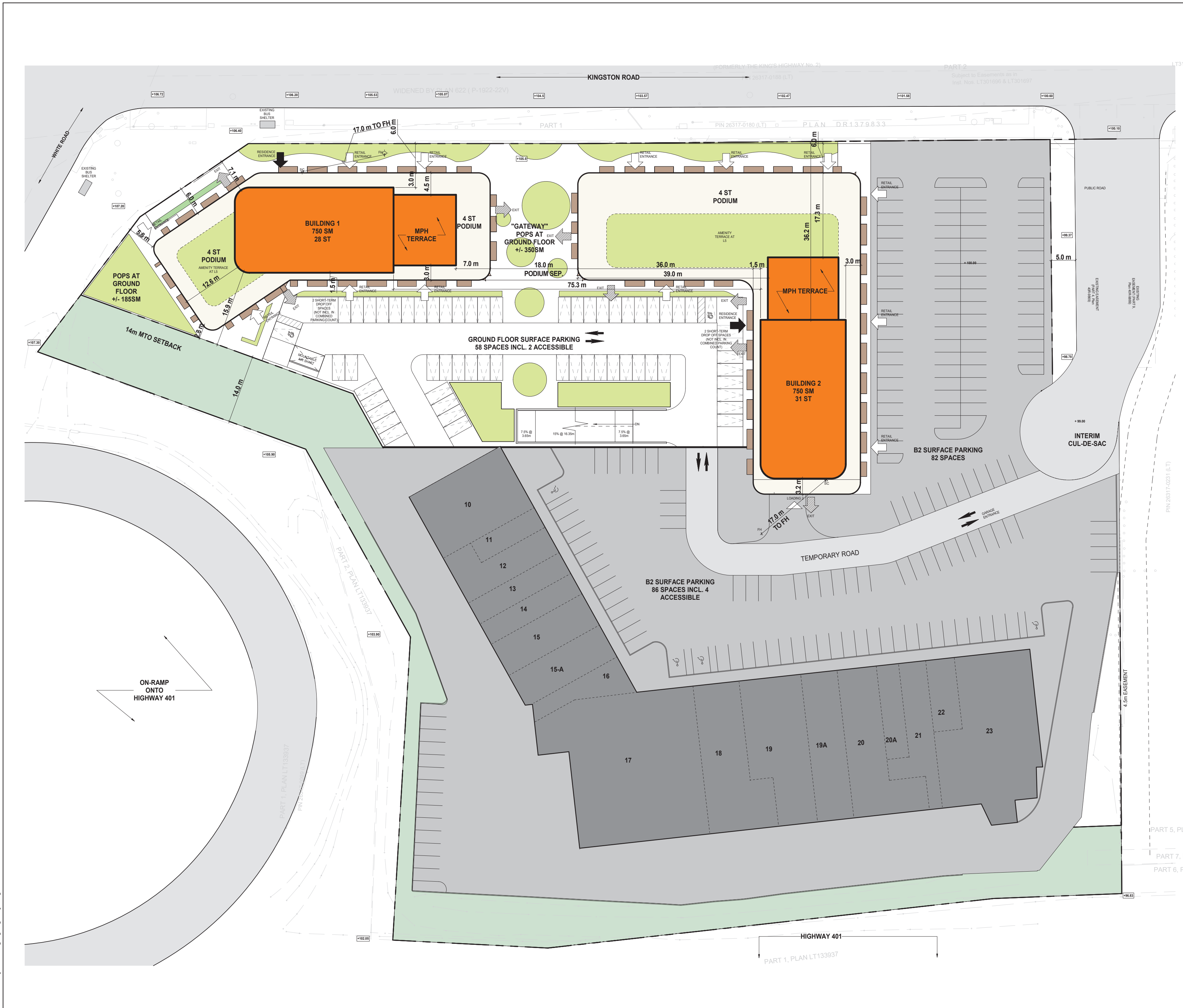
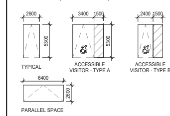


SITE PLAN LEGEND

- PROPERTY LINE
- MAIN BUILDING ENTRANCE
- RETAIL ENTRANCE
- EXIT
- VEHICLE / LOADING ENTRANCE / EXIT
- FIRE HYDRANT
- SIAMESE CONNECTION

PARKING LEGEND (NEW SPACES ONLY):



PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
GF*	58	0	2
B1	0	126	0
B2-INT	6	132	4
B2-EXT**	168	0	4
P1	0	190	2
TOTALS	232	448	12
RATIO	0.2 /UNIT OR 2.87 / 100 m²	0.65 /UNIT	

* ADDITIONAL TEMPORARY PUDO SPACES ON GF NOTED IN PLAN ARE NOT INCLUDED IN THE PARKING COUNT
** B2 EXTERIOR SPACES TO BE A MIX OF EXISTING SPACES & NEW SPACES

RESIDENTIAL & RETAIL STATS:

- NEW RESIDENTIAL UNITS:
  - BUILDING 1: 316 UNITS
  - BUILDING 2: 376 UNITS
  - **TOTAL: 692 UNITS**
- APPROXIMATE RETAIL GFA:
  - BUILDING 1: 1,106 m^2 / 11,896 ft^2
  - BUILDING 2: 2,816 m^2 / 30,303 ft^2
  - RETAINED: 4,160 m^2 / 44,778 ft^2
  - **TOTAL: 8,082 m^2 / 86,977 ft^2**

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for
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21057 PROJECT | 1:400 SCALE | AO DRAWN | YA REVIEWED

Preliminary Phasing Plan

A102.S

2024-10-31 2:27:50 PM

PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
   - 2600mm WIDE X 6400mm LONG (PARALLEL)

2. MAINTAIN MININUM DRIVE AISLE WIDTH OF 6500mm UNLESS OTHERWISE NOTED.

3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

R RESIDENTIAL PARKING SPACE
V COMBINED RETAIL/VISITOR PARKING SPACE
1830 915 BIKE PARKING (HORIZONTAL)
1766 2134 610 BIKE PARKING (STACKED)
1200 600 BIKE PARKING (VERTICAL)
ELECTRIC BICYCLE SPACE
ELECTRIC VEHICLE READY SPACE
ELECTRIC VEHICLE ROUGH-IN SPACE

2600 5300 TYPICAL
3400 1500 5300 ACCESSIBLE VISITOR - TYPE A
2400 1500 ACCESSIBLE VISITOR - TYPE B
6400 2600 PARALLEL SPACE

PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
L4	0	122	0
L3	0	121	0
L2	0	120	0
GF	132	104	3
B1	65	92	0
B2	141*	119**	8
P1	0	460***	8
TOTALS	350	1,138	19
RATIO	0.2 /UNIT	0.65 /UNIT	

* 69 SHORT-TERM SPACES ON B2 TO BE FITTED WITH EV-ROUGH INS (20% OF TOTAL)
** 113 LONG-TERM SPACES ON B2 TO BE EV-READY (10% OF TOTAL)
*** 455 LONG-TERM SPACES ON P1 TO BE FITTED WITH EV-ROUGH INS (40% OF TOTAL)
**** ADDITIONAL TEMP. PUDO SPACES ON GROUND FLOOR NOTED IN PLAN ARE NOT INCLUDED IN THE PARKING COUNT

BICYCLE COUNT:

LEVEL	SHORT -TERM RESIDENTIAL	LONG-TERM RESIDENTIAL	SHORT-TERM RETAIL	LONG-TERM RETAIL
B1	0	726*	0	0
B2	174	0	2	4
P1	0	150	0	0
TOTALS	174	876	2	4
RATIO	0.1 /UNIT	0.5 /UNIT	min. 1	1/1000 m²

* 131 ELECTRIC BIKE SPACES ON B1 (15% OF LONG-TERM)

** BICYCLE MOUNTING:
103 VERTICAL SPACES (9.8%)
667 SINGLE HORTIZONTAL SPACES (63.2%)
286 STACKED HORIZONTAL SPACES (27.0%)

*** ALL LONG-TERM RESIDENTIAL BICYCLE STORAGE ROOMS TO HAVE MIN. 1 BIKE REPAIR STATION 1.8m x 2.6m

Date	No.	Description

REVISION RECORD

31-08-2024	Issued for Rezoning

ISSUE RECORD

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Quadrangle

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t 416 598 1240 www.bdpquadrangle.com

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Ontario, Canada

for
Resident

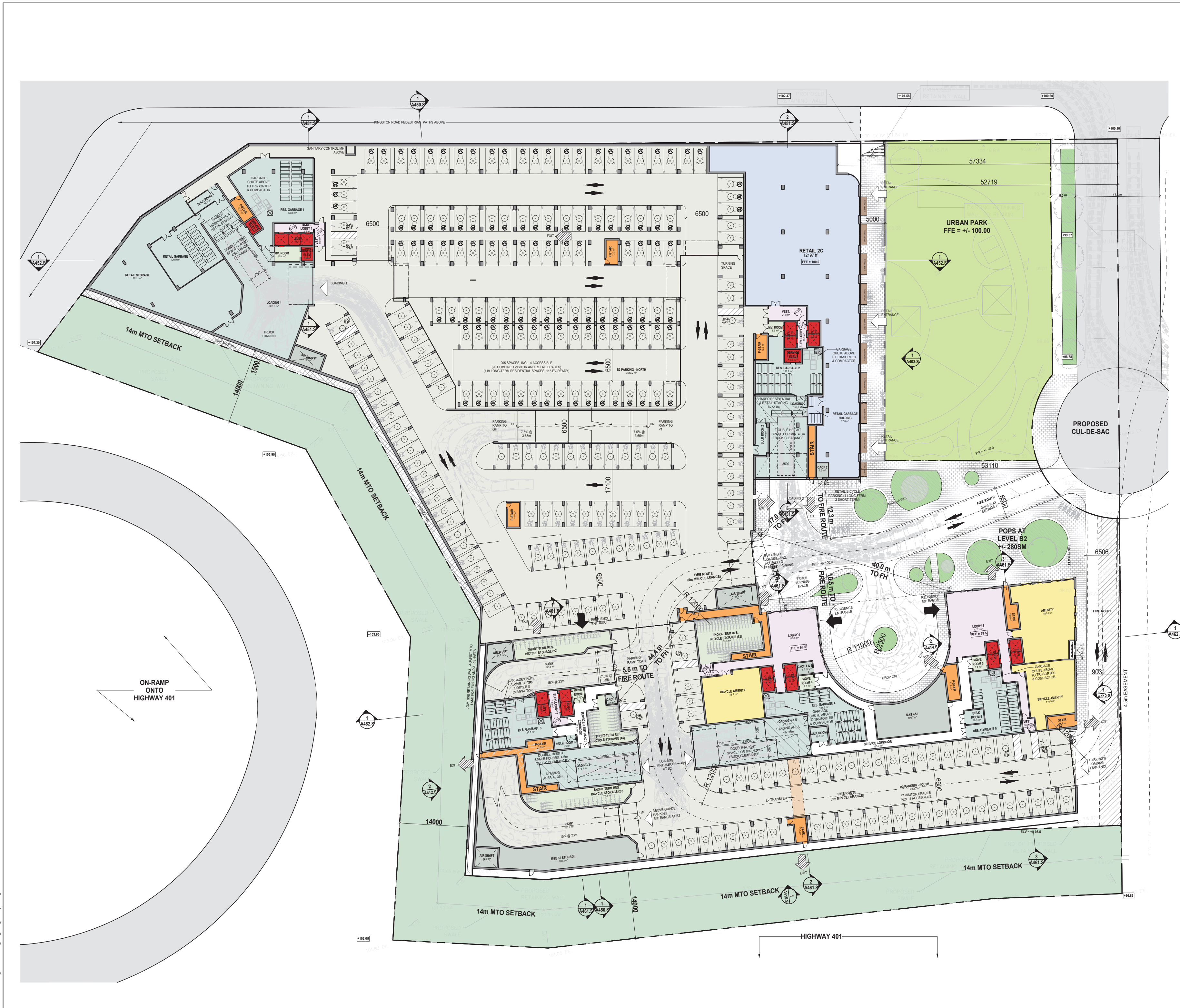
21057	1:250	MT	YA
PROJECT	SCALE	DRAWN	REVIEWED

Underground Level P1

A151.S

2024-10-31 2:29:50 PM

Autodesk Docs://705 Kingston Road/BDPQ_21057_705 Kingston Rd_R2023.rvt

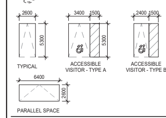


PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
   - 2600mm WIDE X 6400mm LONG (PARALLEL)
2. MAINTAIN MININUM DRIVE AISLE WIDTH OF 6500mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

R RESIDENTIAL PARKING SPACE
V COMBINED RETAIL/VISITOR PARKING SPACE
BIKE PARKING (HORIZONTAL)
BIKE PARKING (STACKED)
BIKE PARKING (VERTICAL)
ELECTRIC BICYCLE SPACE
ELECTRIC VEHICLE READY SPACE
ELECTRIC VEHICLE ROUGH-IN SPACE



PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
L4	0	122	0
L3	0	121	0
L2	0	120	0
GF	132	104	3
B1	65	92	0
B2	141*	119**	8
P1	0	460***	8
TOTALS	350	1,138	19
RATIO	0.2 /UNIT	0.65 /UNIT	

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**** ADDITIONAL TEMP. PUDO SPACES ON GROUND FLOOR NOTED IN PLAN ARE NOT INCLUDED IN THE PARKING COUNT

BICYCLE COUNT:

LEVEL	SHORT -TERM RESIDENTIAL	LONG-TERM RESIDENTIAL	SHORT-TERM RETAIL	LONG-TERM RETAIL
B1	0	726*	0	0
B2	174	0	2	4
P1	0	150	0	0
TOTALS	174	876	2	4
RATIO	0.1 /UNIT	0.5 /UNIT	min. 1	1/1000 m^2

* 131 ELECTRIC BIKE SPACES ON B1 (15% OF LONG-TERM)
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103 VERTICAL SPACES (9.8%)
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*** ALL LONG-TERM RESIDENTIAL BICYCLE STORAGE ROOMS TO HAVE MIN. 1 BIKE REPAIR STATION 1.8m x 2.6m

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Ontario, Canada

for
Resident

21057 1:250 MT YA
PROJECT SCALE DRAWN REVIEWED

Level B2

A152.S

2024-10-31 2:31:27 PM

PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
   - 2600mm WIDE X 6400mm LONG (PARALLEL)
2. MAINTAIN MININUM DRIVE AISLE WIDTH OF 6500mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

R RESIDENTIAL PARKING SPACE
V COMBINED RETAIL/VISITOR PARKING SPACE
BIKE PARKING (HORIZONTAL) 1830 915
BIKE PARKING (STACKED) 1766 2134 610
BIKE PARKING (VERTICAL) 1200 600
ELECTRIC BICYCLE SPACE
ELECTRIC VEHICLE READY SPACE
ELECTRIC VEHICLE ROUGH-IN SPACE

TYPICAL 2600 5300
ACCESSIBLE VISITOR - TYPE A 3400 1500 5300
ACCESSIBLE VISITOR - TYPE B 2400 1500
PARALLEL SPACE 6400 2600

PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
L4	0	122	0
L3	0	121	0
L2	0	120	0
GF	132	104	3
B1	65	92	0
B2	141*	119**	8
P1	0	460***	8
TOTALS	350	1,138	19
RATIO	0.2 /UNIT	0.65 /UNIT	

* 69 SHORT-TERM SPACES ON B2 TO BE FITTED WITH EV-ROUGH INS (20% OF TOTAL)
** 113 LONG-TERM SPACES ON B2 TO BE EV-READY (10% OF TOTAL)
*** 455 LONG-TERM SPACES ON P1 TO BE FITTED WITH EV-ROUGH INS (40% OF TOTAL)
**** ADDITIONAL TEMP. PUDO SPACES ON GROUND FLOOR NOTED IN PLAN ARE NOT INCLUDED IN THE PARKING COUNT

BICYCLE COUNT:

LEVEL	SHORT -TERM RESIDENTIAL	LONG-TERM RESIDENTIAL	SHORT-TERM RETAIL	LONG-TERM RETAIL
B1	0	726*	0	0
B2	174	0	2	4
P1	0	150	0	0
TOTALS	174	876	2	4
RATIO	0.1 /UNIT	0.5 /UNIT	min. 1	1/1000 m²

* 131 ELECTRIC BIKE SPACES ON B1 (15% OF LONG-TERM)

** BICYCLE MOUNTING:
103 VERTICAL SPACES (9.8%)
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286 STACKED HORIZONTAL SPACES (27.0%)

*** ALL LONG-TERM RESIDENTIAL BICYCLE STORAGE ROOMS TO HAVE MIN. 1 BIKE REPAIR STATION 1.8m x 2.6m

Date	No.	Description

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Ontario, Canada

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Resident

21057	1:250	MT	YA
PROJECT	SCALE	DRAWN	REVIEWED

Level B1

A153.S

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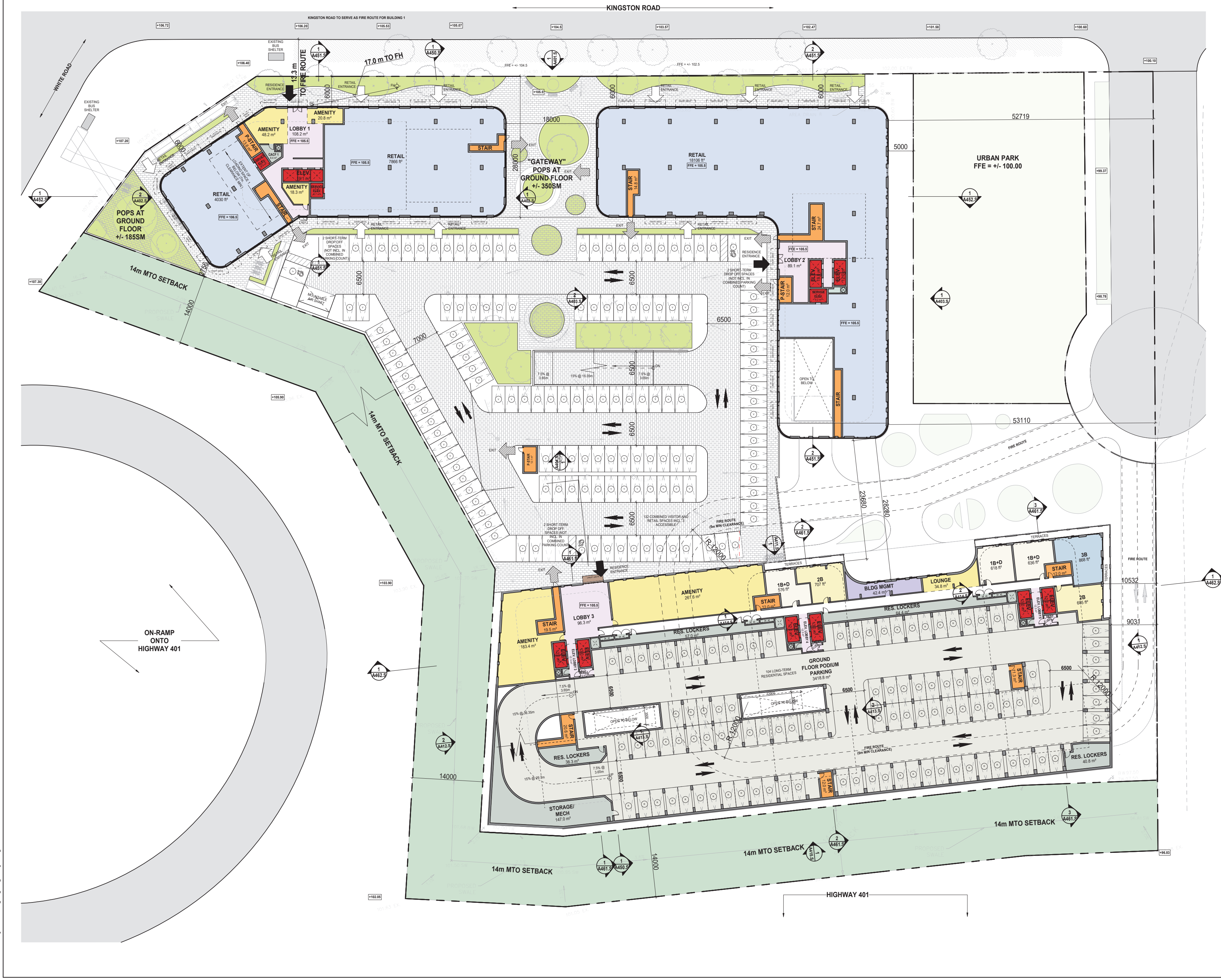

SITE PLAN LEGEND

PROPERTY LINE

MAIN BUILDING ENTRANCE

RETAIL ENTRANCE

EXIT

VEHICLE / LOADING ENTRANCE / EXIT

FIRE HYDRANT

SIAMESE CONNECTION

PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5300mm LONG (NO SIDES OBSTRUCTED)
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PARKING LEGEND:

R RESIDENTIAL PARKING SPACE

V COMBINED RETAIL/VISITOR PARKING SPACE

1830 915 BIKE PARKING (HORIZONTAL)

1766 2134 610 BIKE PARKING (STACKED)

1200 600 BIKE PARKING (VERTICAL)

ELECTRIC BICYCLE SPACE

ELECTRIC VEHICLE READY SPACE

ELECTRIC VEHICLE ROUGH-IN SPACE

2600 5300 TYPICAL

3400 1500 5300 ACCESSIBLE VISITOR - TYPE A

2400 1500 ACCESSIBLE VISITOR - TYPE B

6400 2600 PARALLEL SPACE

PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
L4	0	122	0
L3	0	121	0
L2	0	120	0
GF	132	104	3
B1	65	92	0
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P1	0	460***	8
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BICYCLE COUNT:

LEVEL	SHORT -TERM RESIDENTIAL	LONG-TERM RESIDENTIAL	SHORT-TERM RETAIL	LONG-TERM RETAIL
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Ontario, Canada

for
Resident

PROJECT	SCALE	DRAWN	REVIEWED
21057	As indicated	MT	YA

Ground Floor Plan

A201.S

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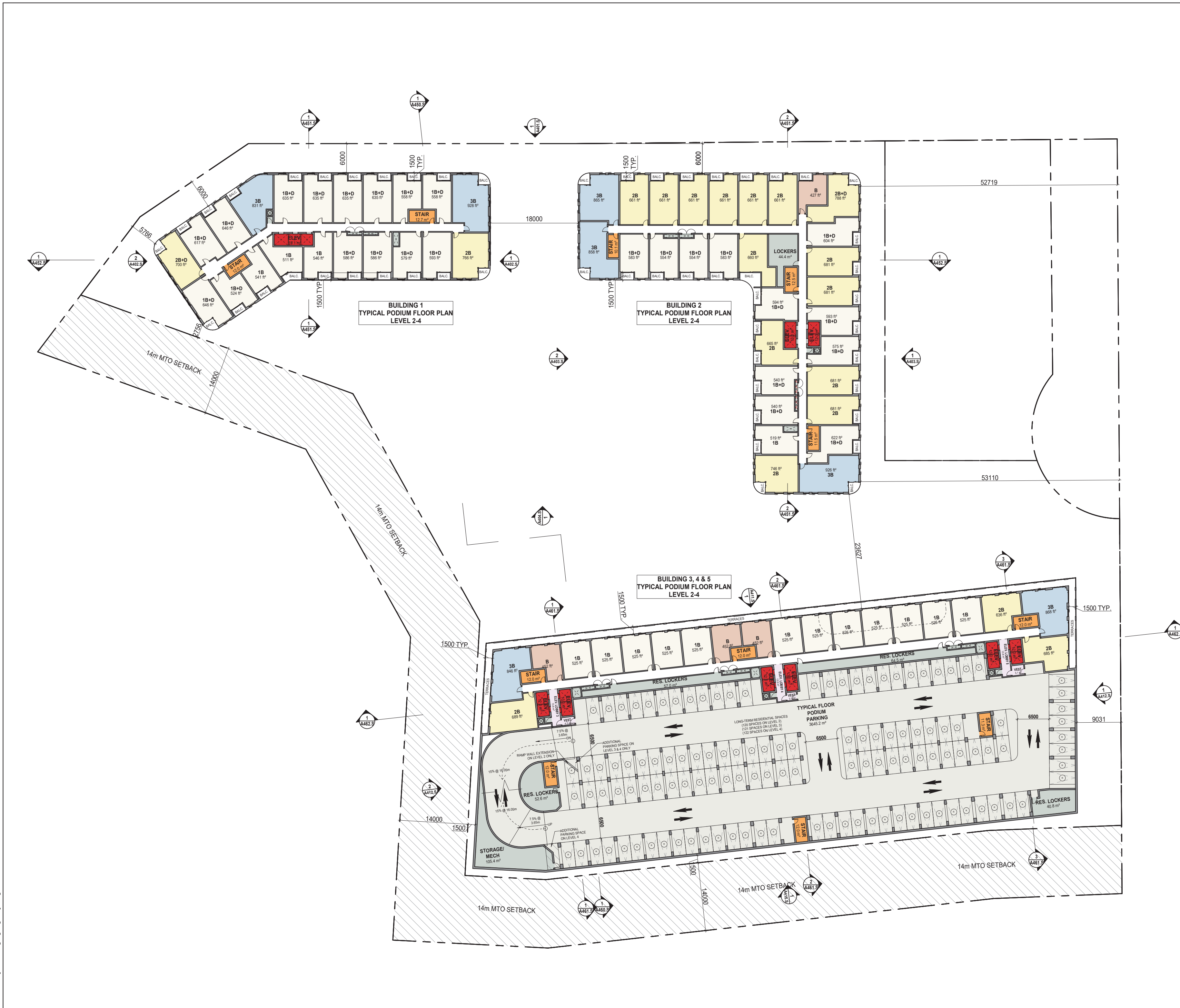

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   - 2600mm WIDE X 6400mm LONG (PARALLEL)
2. MAINTAIN MININUM DRIVE AISLE WIDTH OF 6500mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

R RESIDENTIAL PARKING SPACE
V COMBINED RETAIL/VISITOR PARKING SPACE
BIKE PARKING (HORIZONTAL)
BIKE PARKING (STACKED)
BIKE PARKING (VERTICAL)
ELECTRIC BICYCLE SPACE
ELECTRIC VEHICLE READY SPACE
ELECTRIC VEHICLE ROUGH-IN SPACE

TYPICAL — ACCESSIBLE VISITOR - TYPE A — ACCESSIBLE VISITOR - TYPE B — PARALLEL SPACE

PARKING COUNT:

LEVEL	COMBINED VISITOR & RETAIL	RESIDENTIAL	OF WHICH ACCESSIBLE
L4	0	122	0
L3	0	121	0
L2	0	120	0
GF	132	104	3
B1	65	92	0
B2	141*	119**	8
P1	0	460***	8
TOTALS	350	1,138	19
RATIO	0.2 /UNIT	0.65 /UNIT	

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*** 455 LONG-TERM SPACES ON P1 TO BE FITTED WITH EV-ROUGH INS (40% OF TOTAL)
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BICYCLE COUNT:

LEVEL	SHORT -TERM RESIDENTIAL	LONG-TERM RESIDENTIAL	SHORT-TERM RETAIL	LONG-TERM RETAIL
B1	0	726*	0	0
B2	174	0	2	4
P1	0	150	0	0
TOTALS	174	876	2	4
RATIO	0.1 /UNIT	0.5 /UNIT	min. 1	1/1000 m²

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286 STACKED HORIZONTAL SPACES (27.0%)
*** ALL LONG-TERM RESIDENTIAL BICYCLE STORAGE ROOMS TO HAVE MIN. 1 BIKE REPAIR STATION 1.8m x 2.6m

Date	No.	Description

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705 Kingston Road, Pickering

Ontario, Canada

for
Resident

21057	As indicated	MT	YA
PROJECT	SCALE	DRAWN	REVIEWED

Typical Podium Floor Plan (Floor 2-4)

A202.S

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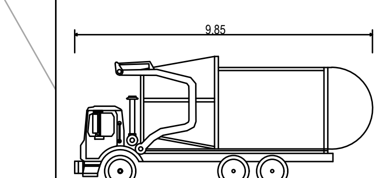
Appendix E:
Vehicle Manoeuvring Diagrams

INBOUND

OUTBOUND

Design Vehicle -
PEEL REGION GARBAGE - FRONT LOADER



Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

NOTE:
PEEL REGION FRONT-LOADING GARBAGE TRUCK STANDARD USED AS DESIGN VEHICLE, WHICH CLOSELY MATCHES THE DIMENSIONS OF THE FRONT-LOADING GARBAGE TRUCK OUTLINED IN APPENDIX "A" OF THE DURHAM REGION TECHNICAL AND RISK MANAGEMENT GUIDELINES FOR WASTE COLLECTION SERVICES ON PRIVATE PROPERTY (SCHEDULE "P" TO BY-LAW 46-2011).

Date Plotted: November 1, 2024 Filename: J:\6589-67\BA\SPR\20249. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

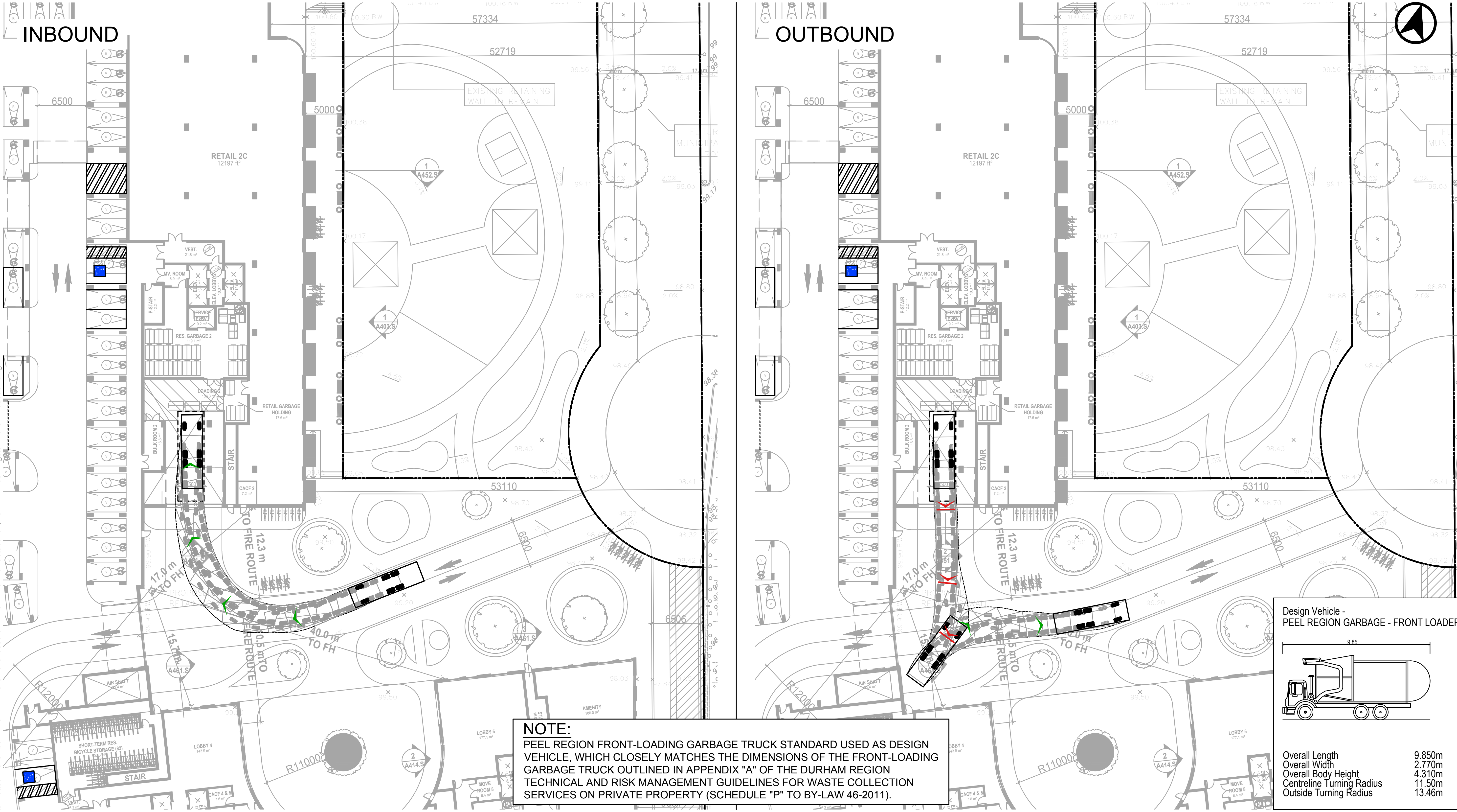
BA Group

705 KINGSTON ROAD
VEHICLE MANOEUVRE DIAGRAM
BUILDING 1
PEEL REGION GARBAGE TRUCK

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0 5 10 15 20m)

Drawing No. VMD-01



NOTE:

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Design Vehicle -
PEEL REGION GARBAGE - FRONT LOADER

9.85

Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

BA Group

705 KINGSTON ROAD

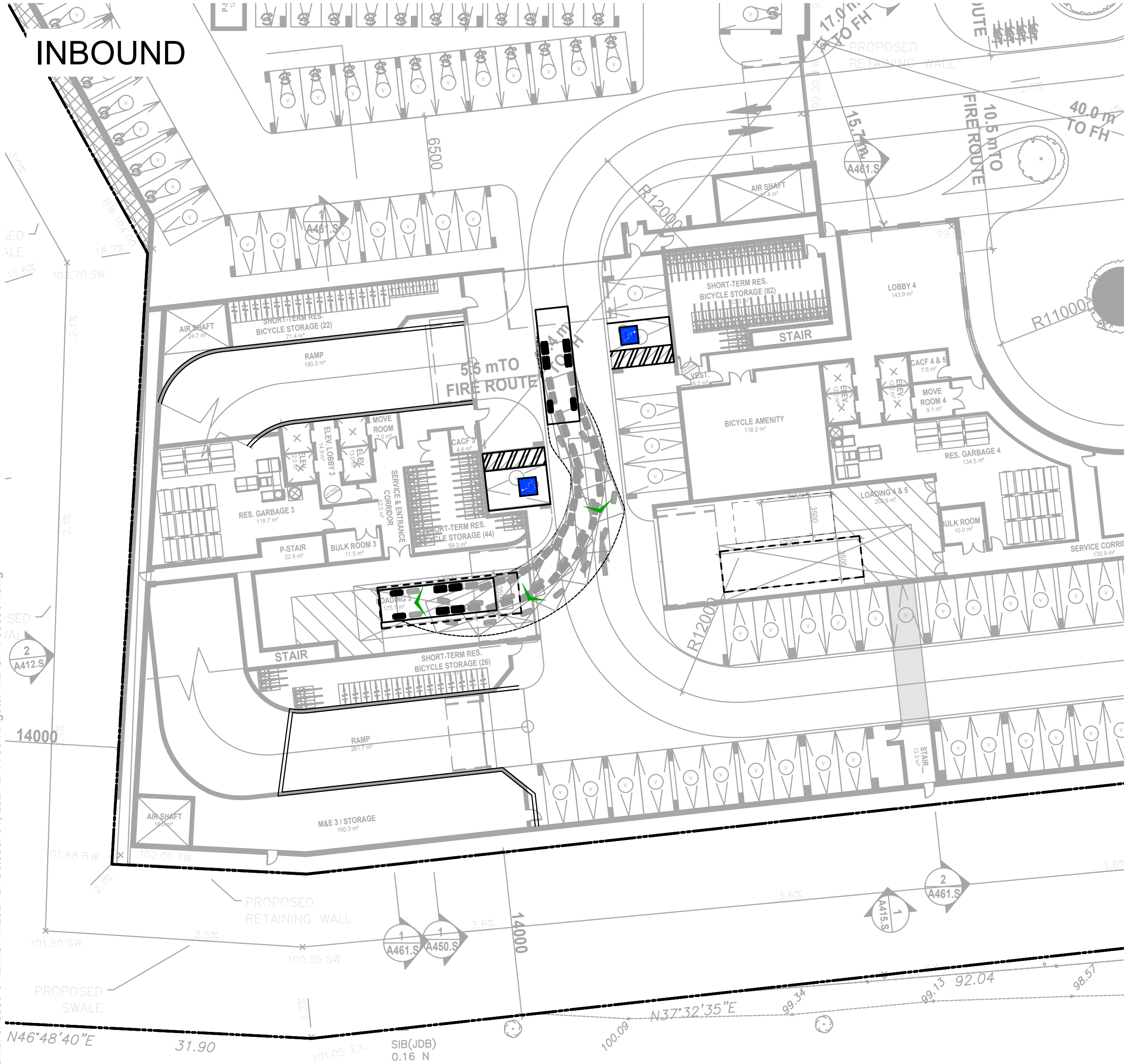
VEHICLE MANOEUVRE DIAGRAM
BUILDING 2
PEEL REGION GARBAGE TRUCK

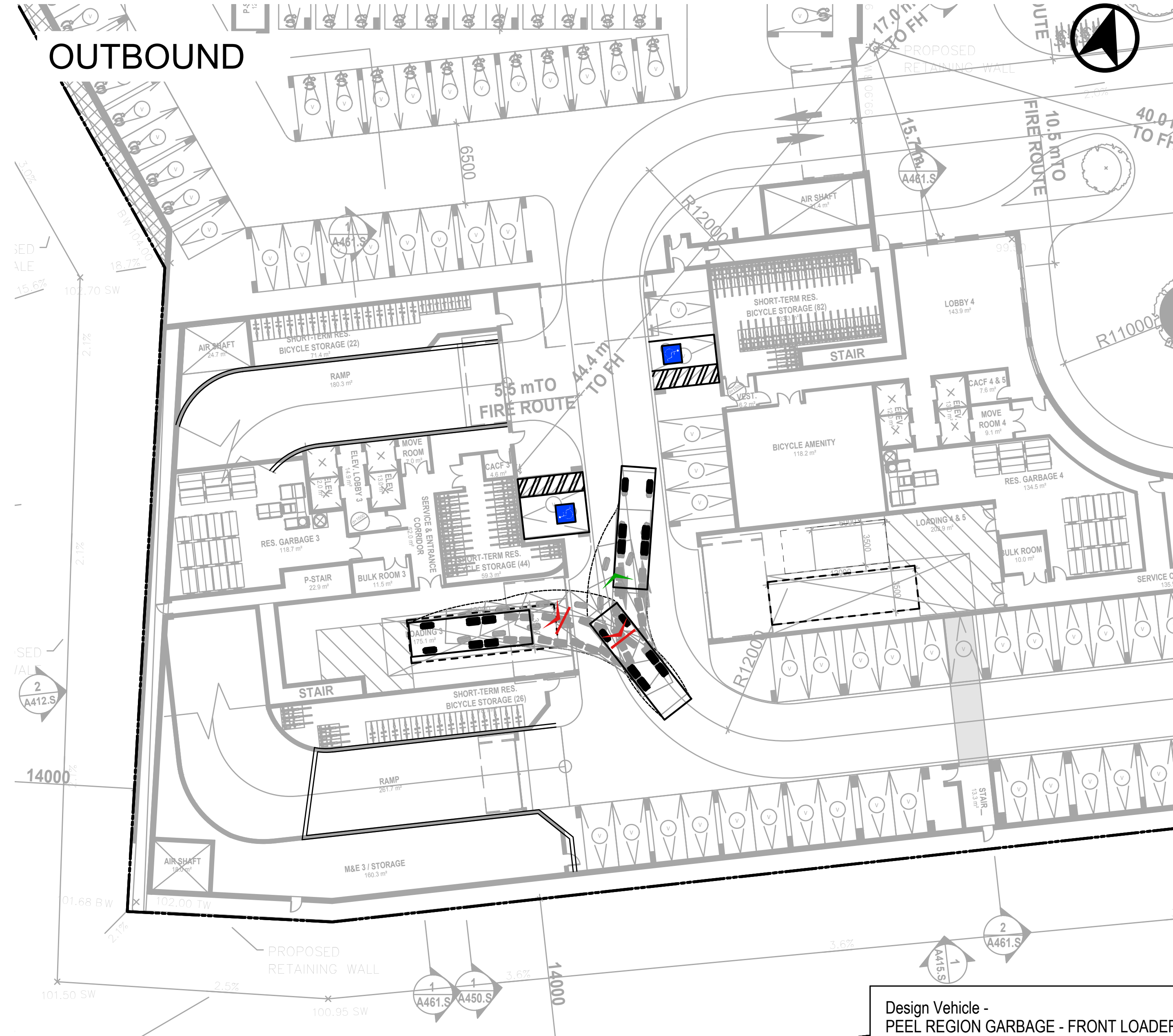
Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0, 5, 10, 15, 20m)

Drawing No. VMD-02

Filename: J:\6589-67\BA\SPR\202419. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg
Date Plotted: November 1, 2024





NOTE:

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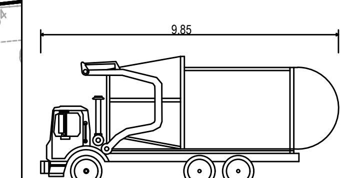
Design Vehicle -
PEEL REGION GARBAGE - FRONT LOADER



Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

BA Group

705 KINGSTON ROAD

VEHICLE MANOEUVRE DIAGRAM
BUILDING 3
PEEL REGION GARBAGE TRUCK

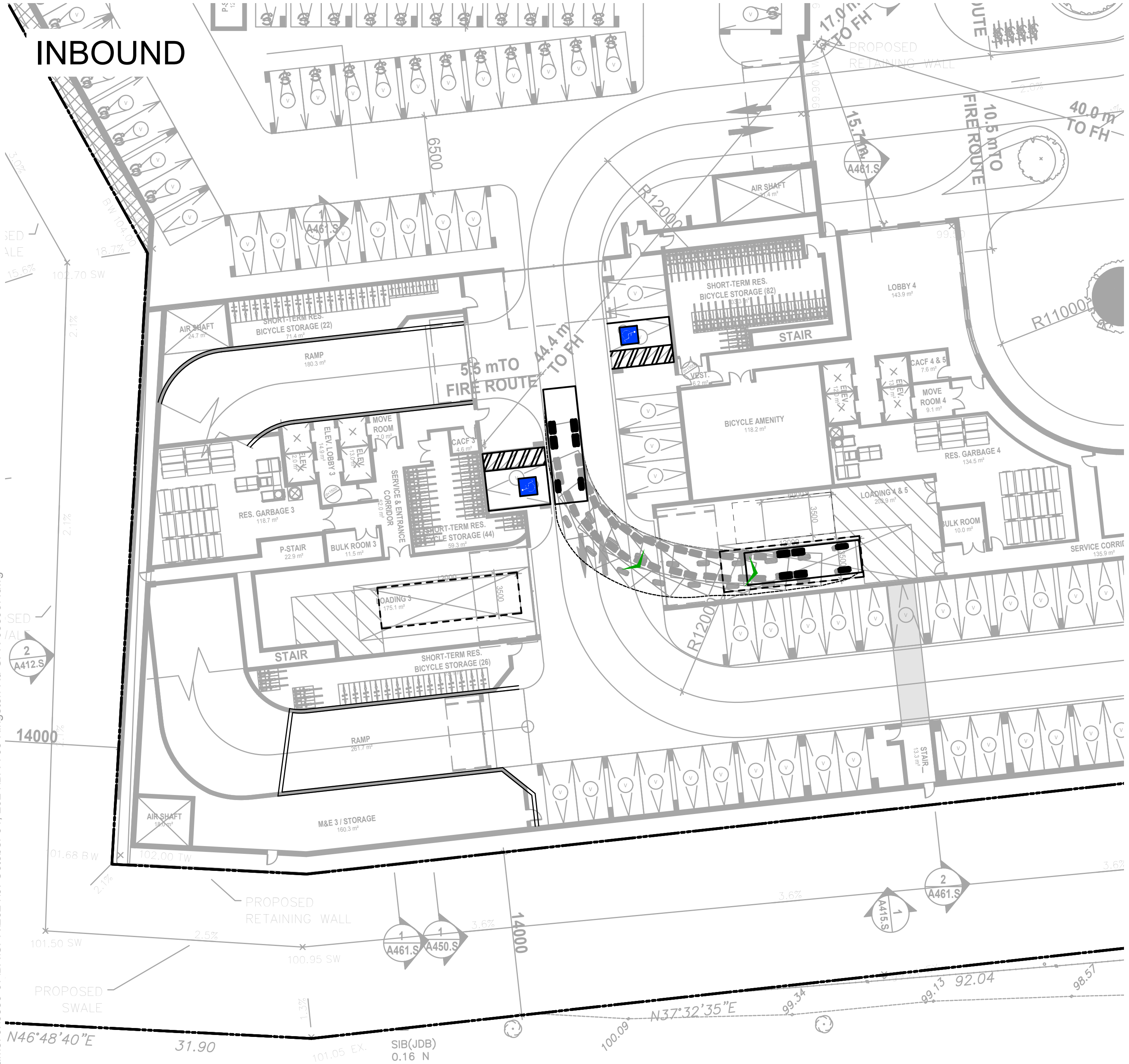
Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

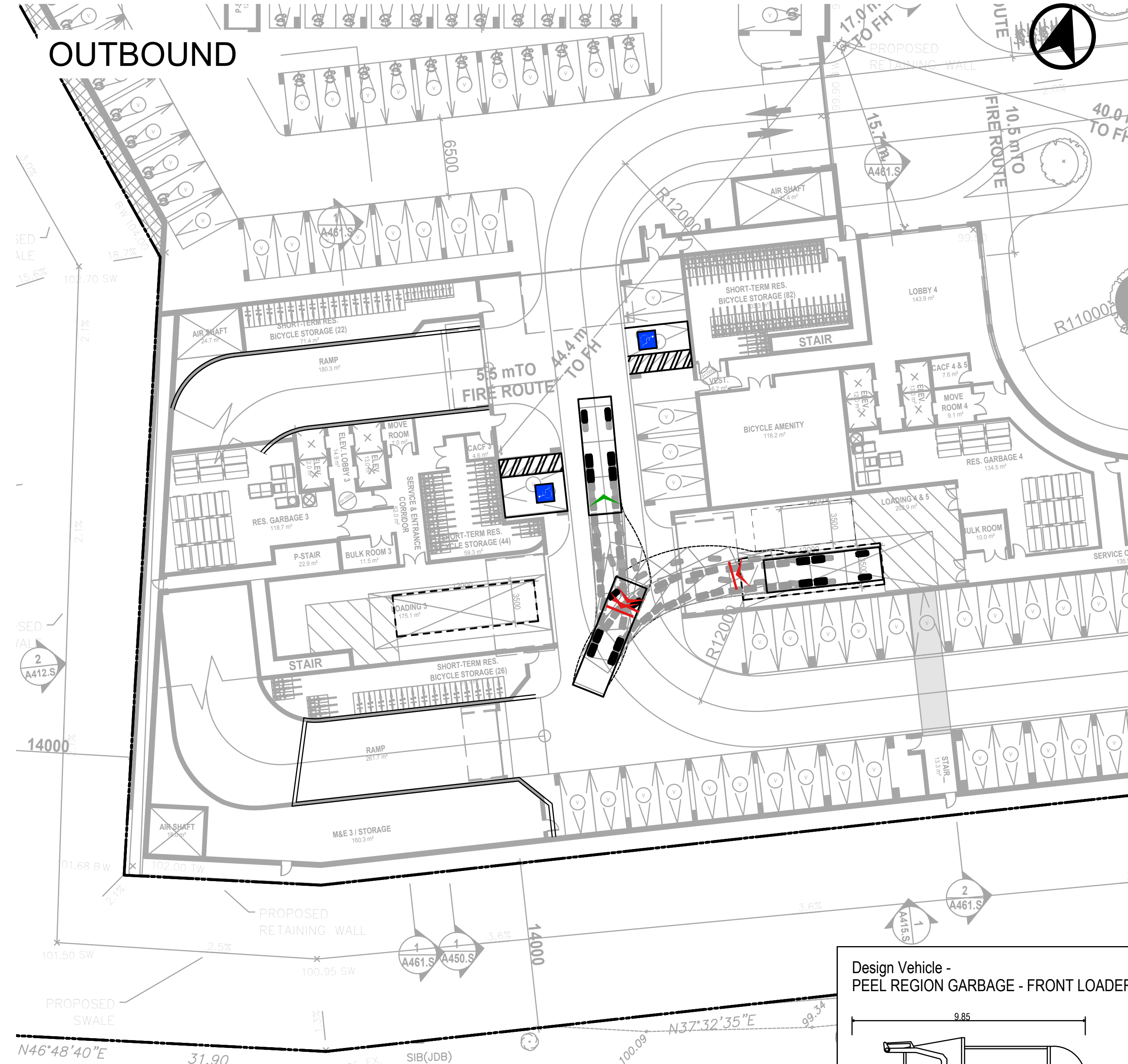
Scale 1:500 (0 5 10 15 20m)

Drawing No. VMD-03

Filename: J:\6589-67\BA\SPR\20241\9. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

Date Plotted: November 1, 2024

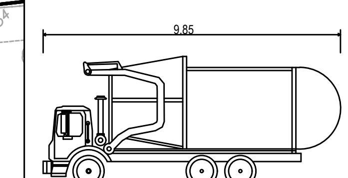




NOTE:

PEEL REGION FRONT-LOADING GARBAGE TRUCK STANDARD USED AS DESIGN VEHICLE, WHICH CLOSELY MATCHES THE DIMENSIONS OF THE FRONT-LOADING GARBAGE TRUCK OUTLINED IN APPENDIX "A" OF THE DURHAM REGION TECHNICAL AND RISK MANAGEMENT GUIDELINES FOR WASTE COLLECTION SERVICES ON PRIVATE PROPERTY (SCHEDULE "P" TO BY-LAW 46-2011).

Design Vehicle -
PEEL REGION GARBAGE - FRONT LOADER



Overall Length	9.850m
Overall Width	2.770m
Overall Body Height	4.310m
Centreline Turning Radius	11.50m
Outside Turning Radius	13.46m

BA Group

705 KINGSTON ROAD
VEHICLE MANOEUVRE DIAGRAM
BUILDING 4/5
PEEL REGION GARBAGE TRUCK

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0, 5, 10, 15, 20m)

Drawing No. VMD-04

Date Plotted: November 1, 2024 Filename: J:\6589-67\BA\SPR\202419. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

Date Plotted: November 1, 2024 Filename: J:\6589-67\BA\SPR\20249, October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

BA Group

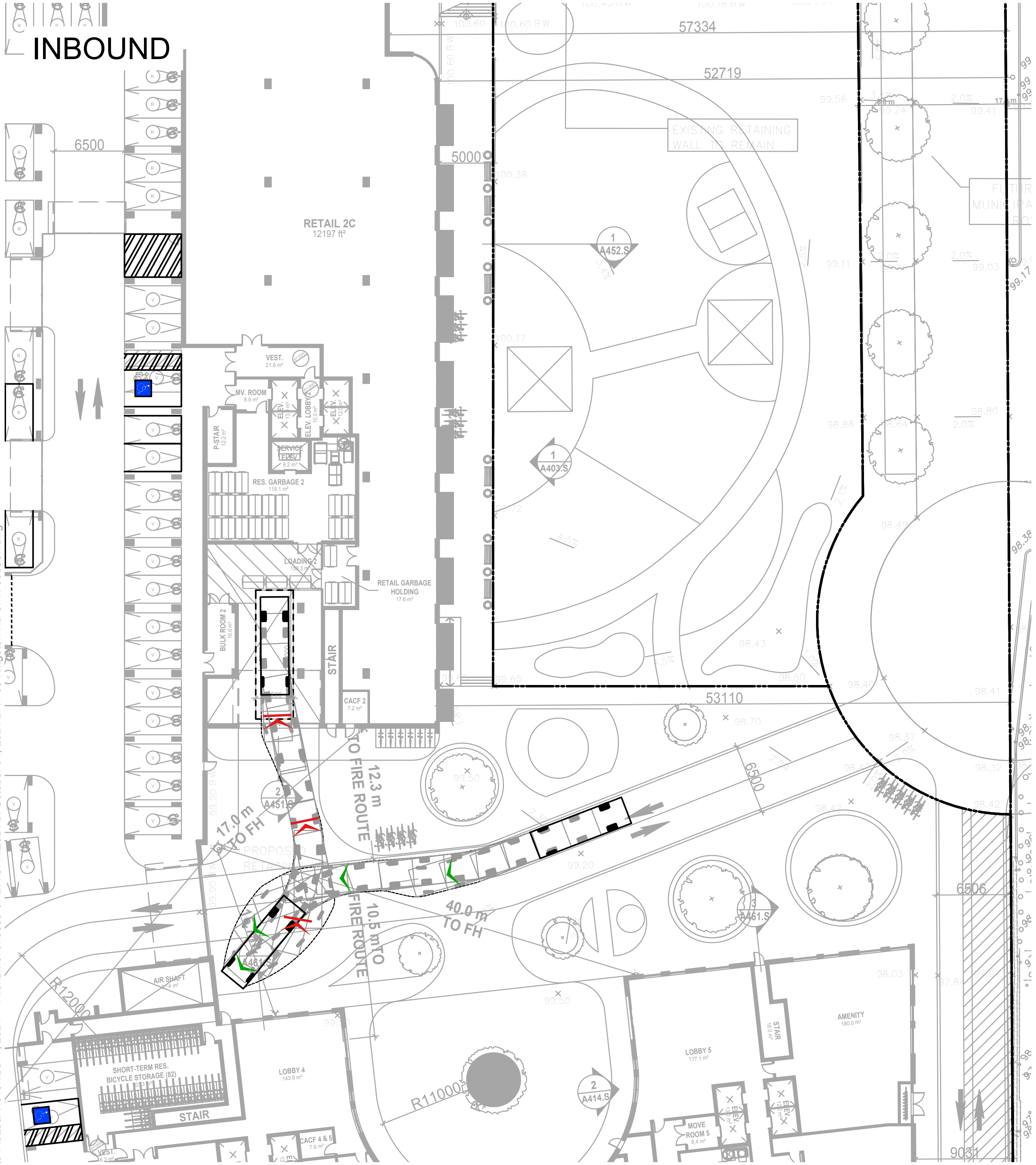
705 KINGSTON ROAD

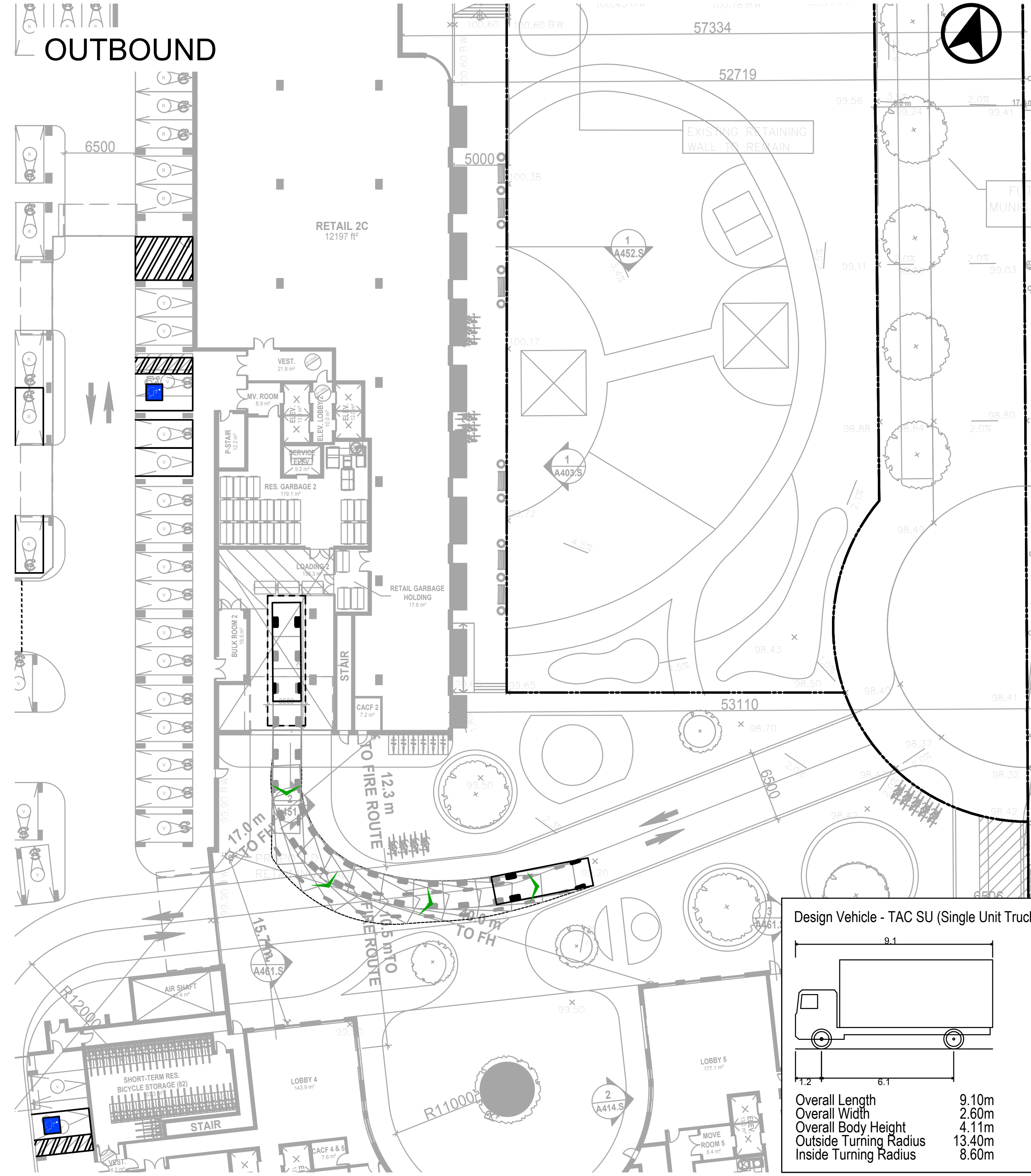
VEHICLE MANOEUVRE DIAGRAM
BUILDING 1
SINGLE UNIT TRUCK

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 — 0 5 10 15 20m

Drawing No. VMD-05





Date Plotted: November 1, 2024 Filename: J:\6589-67\BA\SPR\2024\9. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

BA Group

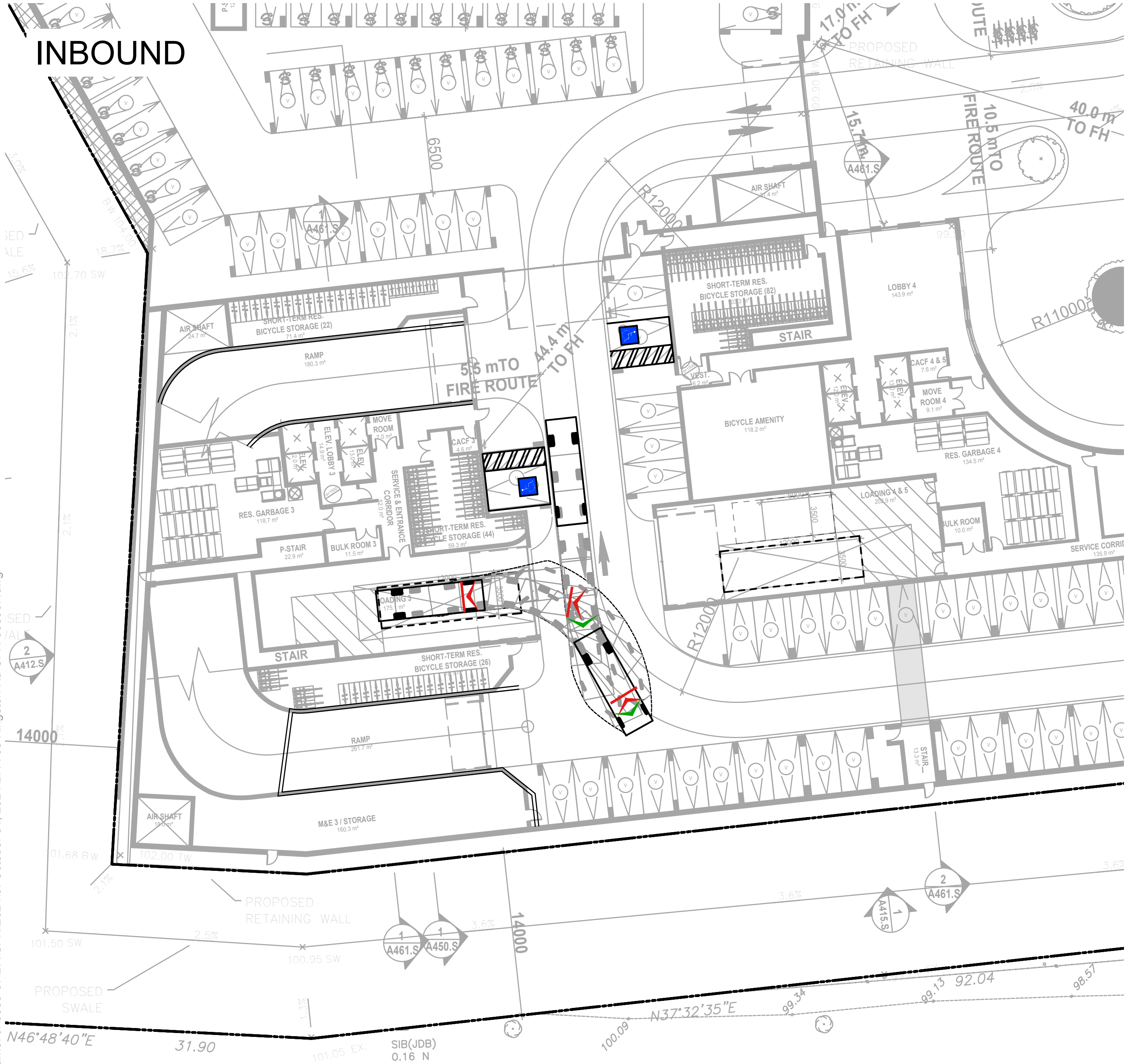
705 KINGSTON ROAD

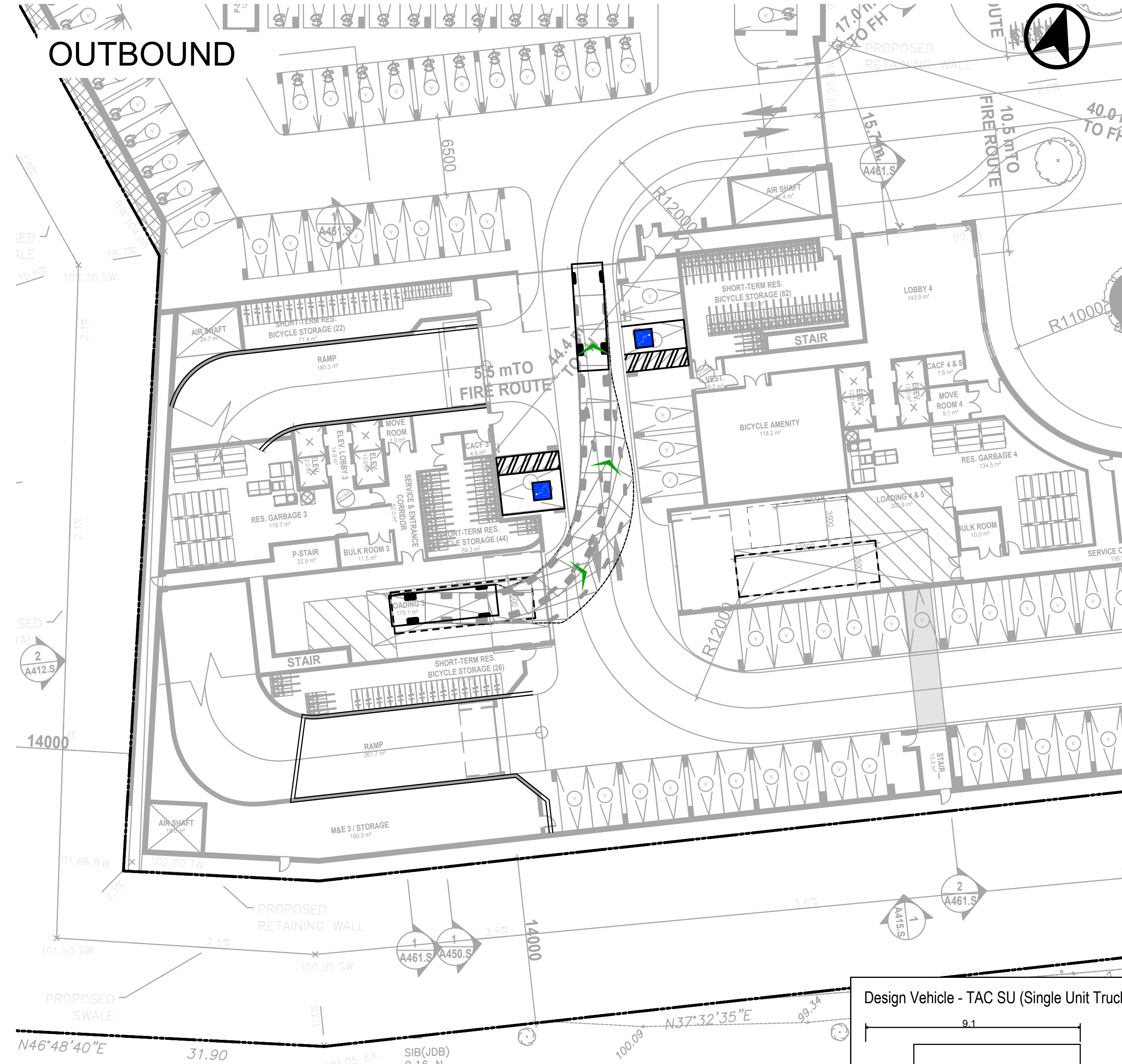
VEHICLE MANOEUVRE DIAGRAM
BUILDING 2
SINGLE UNIT TRUCK

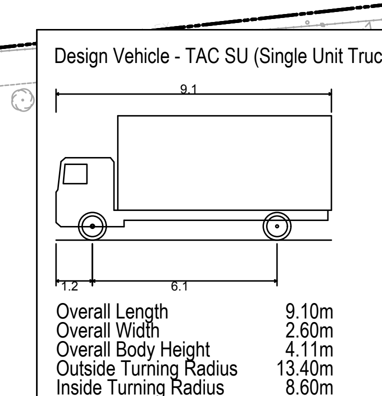
Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0 5 10 15 20m)

Drawing No. VMD-06







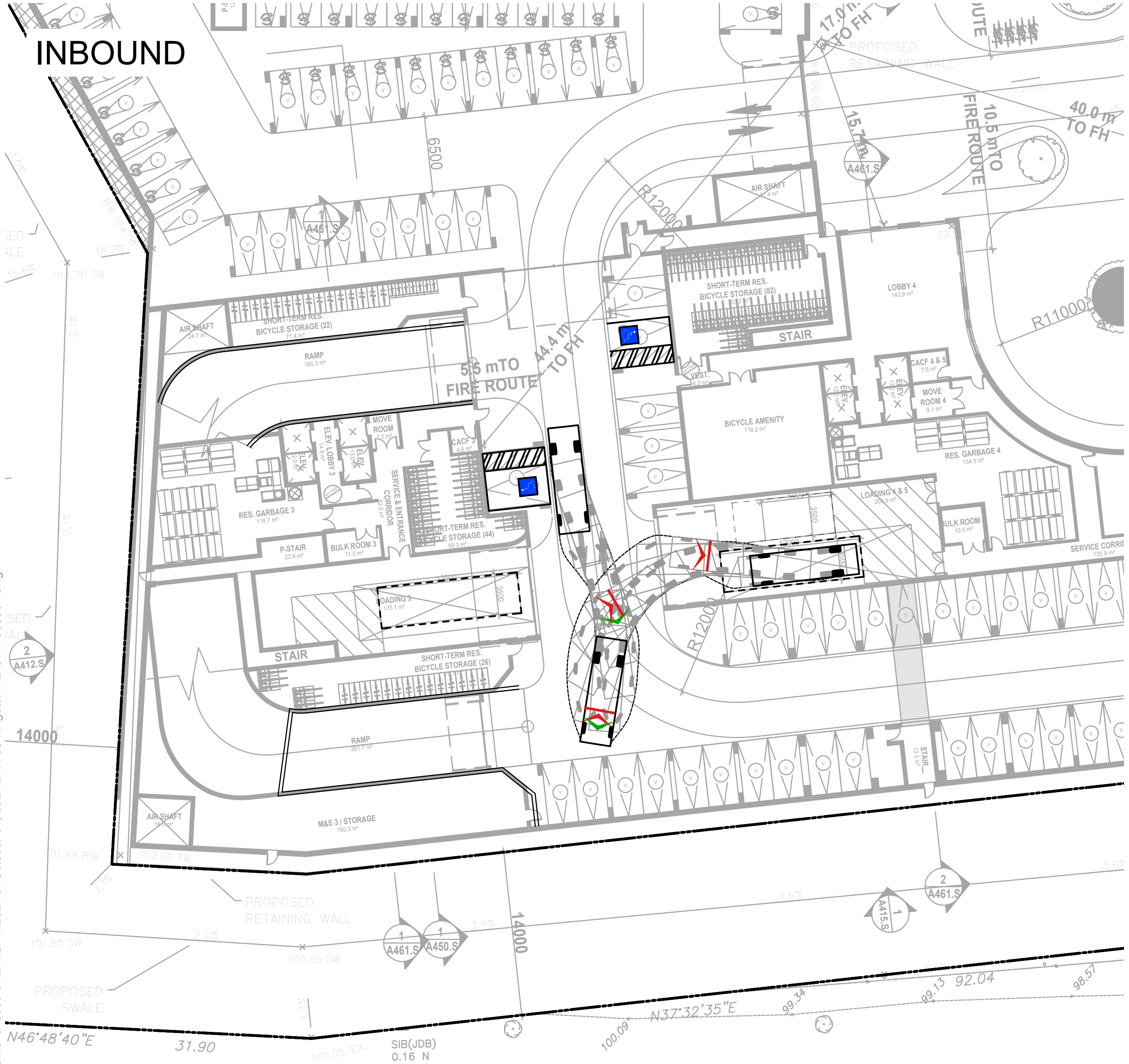
BA Group

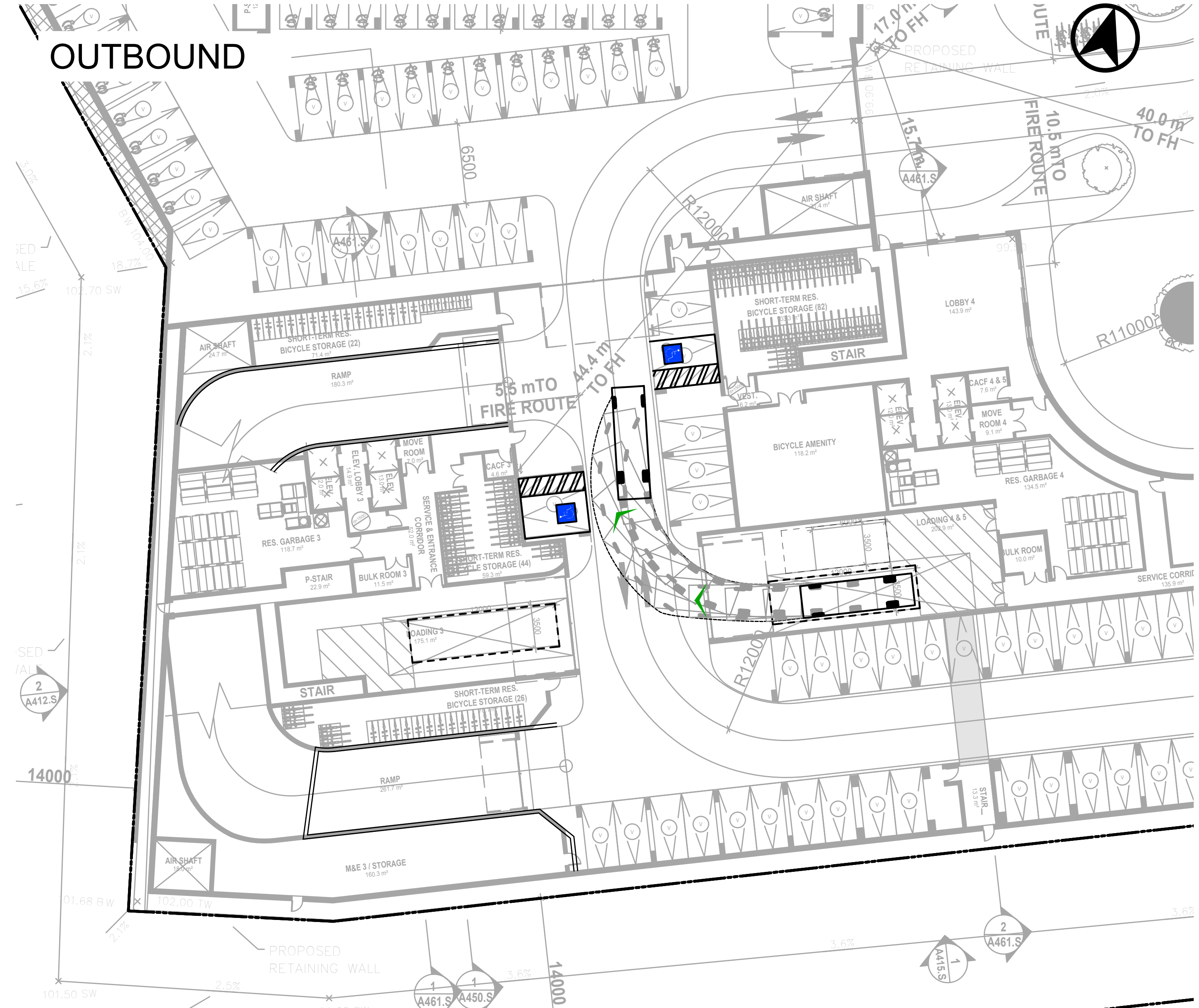
705 KINGSTON ROAD
VEHICLE MANOEUVRE DIAGRAM
BUILDING 3
SINGLE UNIT TRUCK

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

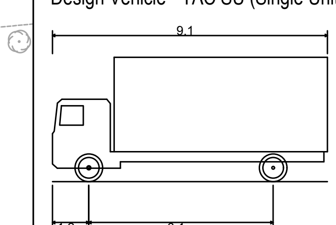
Scale 1:500 (0 5 10 15 20m)

Drawing No. VMD-07





Design Vehicle - TAC SU (Single Unit Truck)



Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

Date Plotted: November 1, 2024 Filename: J:\6589-67\BA\SPR\20241019. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

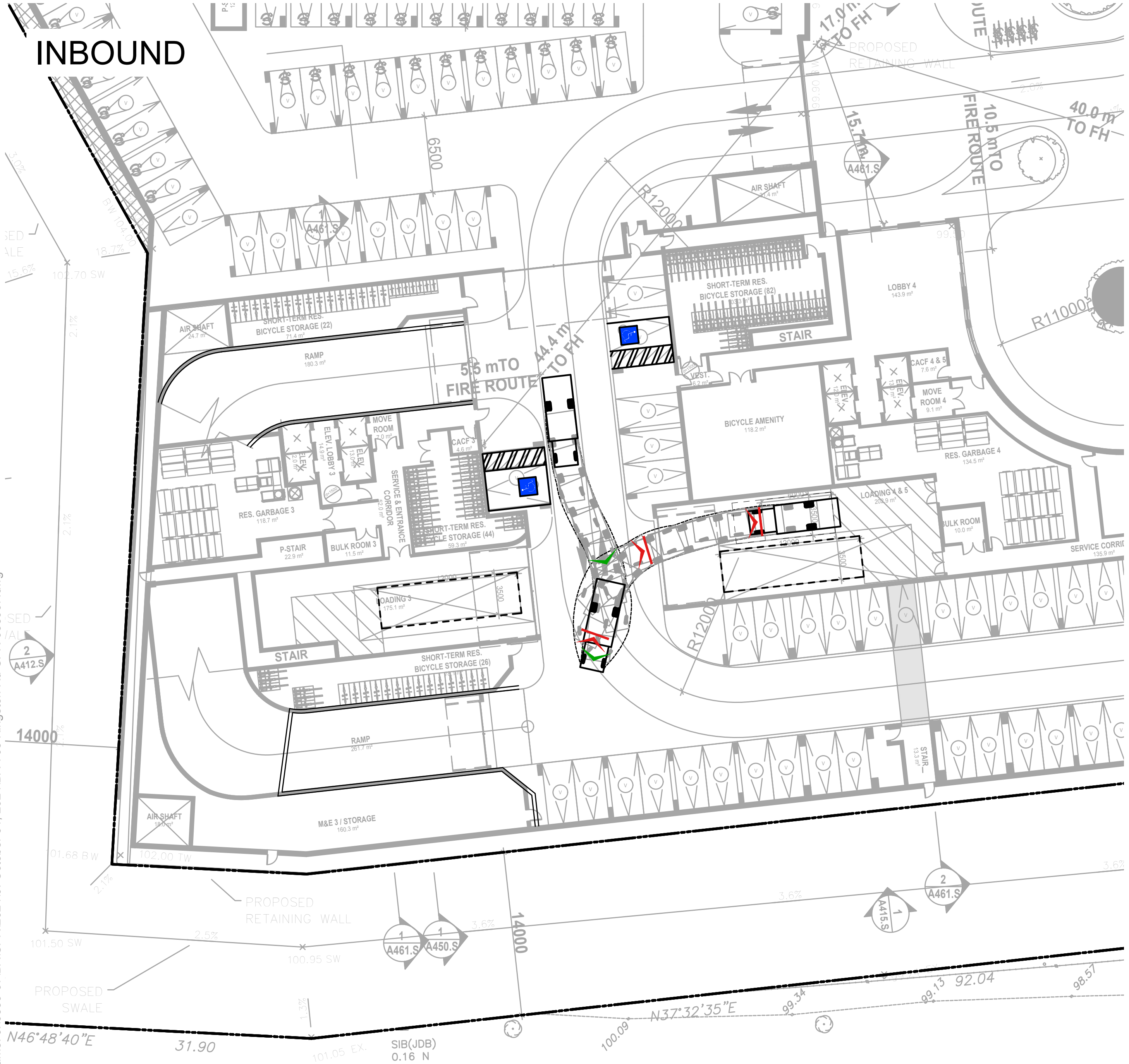
BA Group

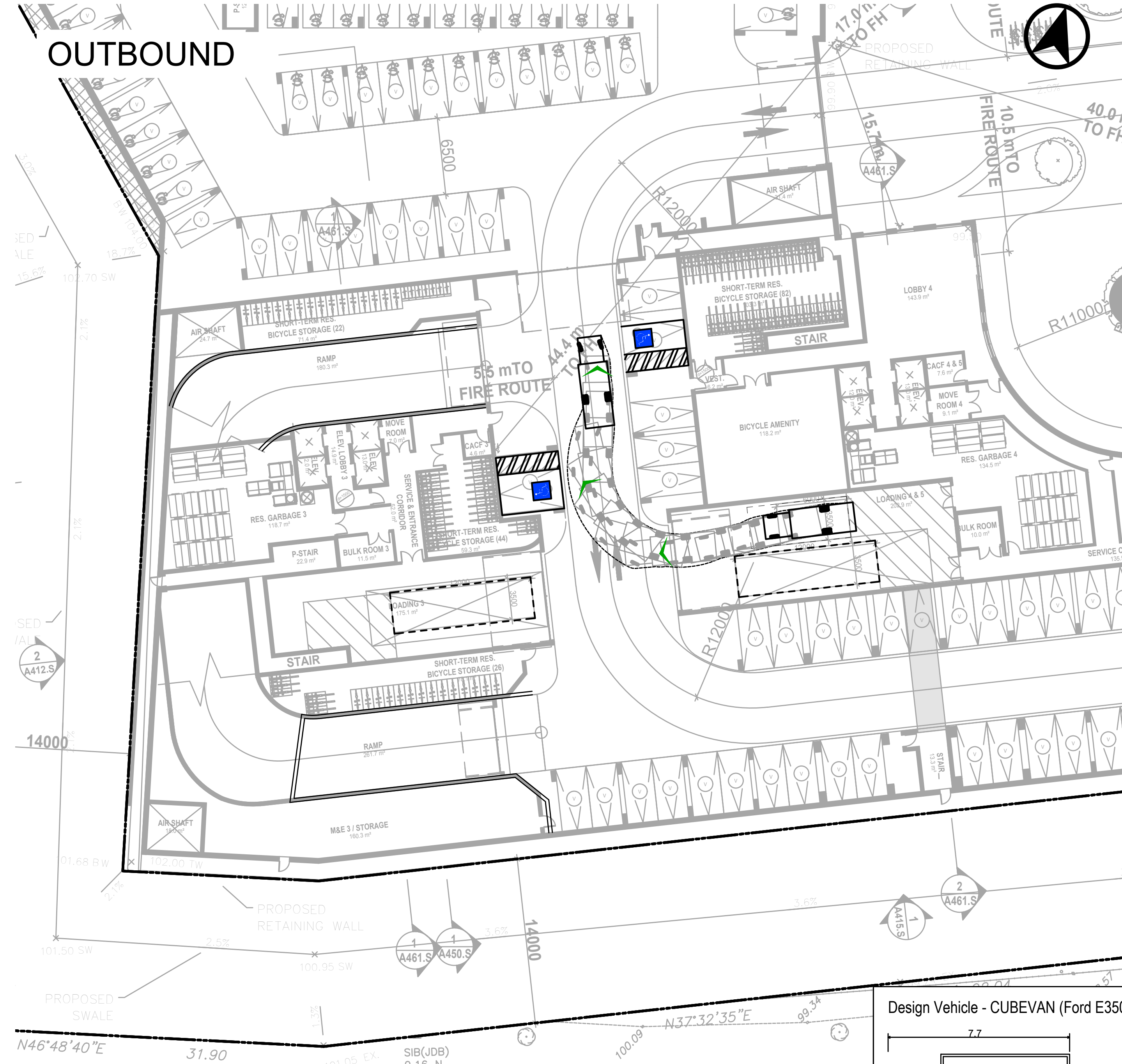
705 KINGSTON ROAD
VEHICLE MANOEUVRE DIAGRAM
BUILDING 4/5
SINGLE UNIT TRUCK

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

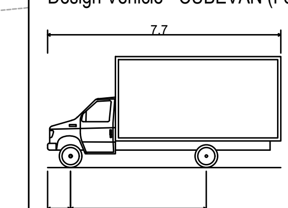
Scale 1:500 (0 5 10 15 20m)

Drawing No. VMD-08





Design Vehicle - CUBEVAN (Ford E350)



Overall Length	7.70m
Overall Width	2.45m
Overall Body Height	3.66m
Outside Turning Radius	9.49m
Inside Turning Radius	5.68m

Filename: J:\6589-67\BA\SPR\202419. October 31, 2024\BA-705 Kingston Rd-SPR-658967.dwg

Date Plotted: November 1, 2024

BA Group

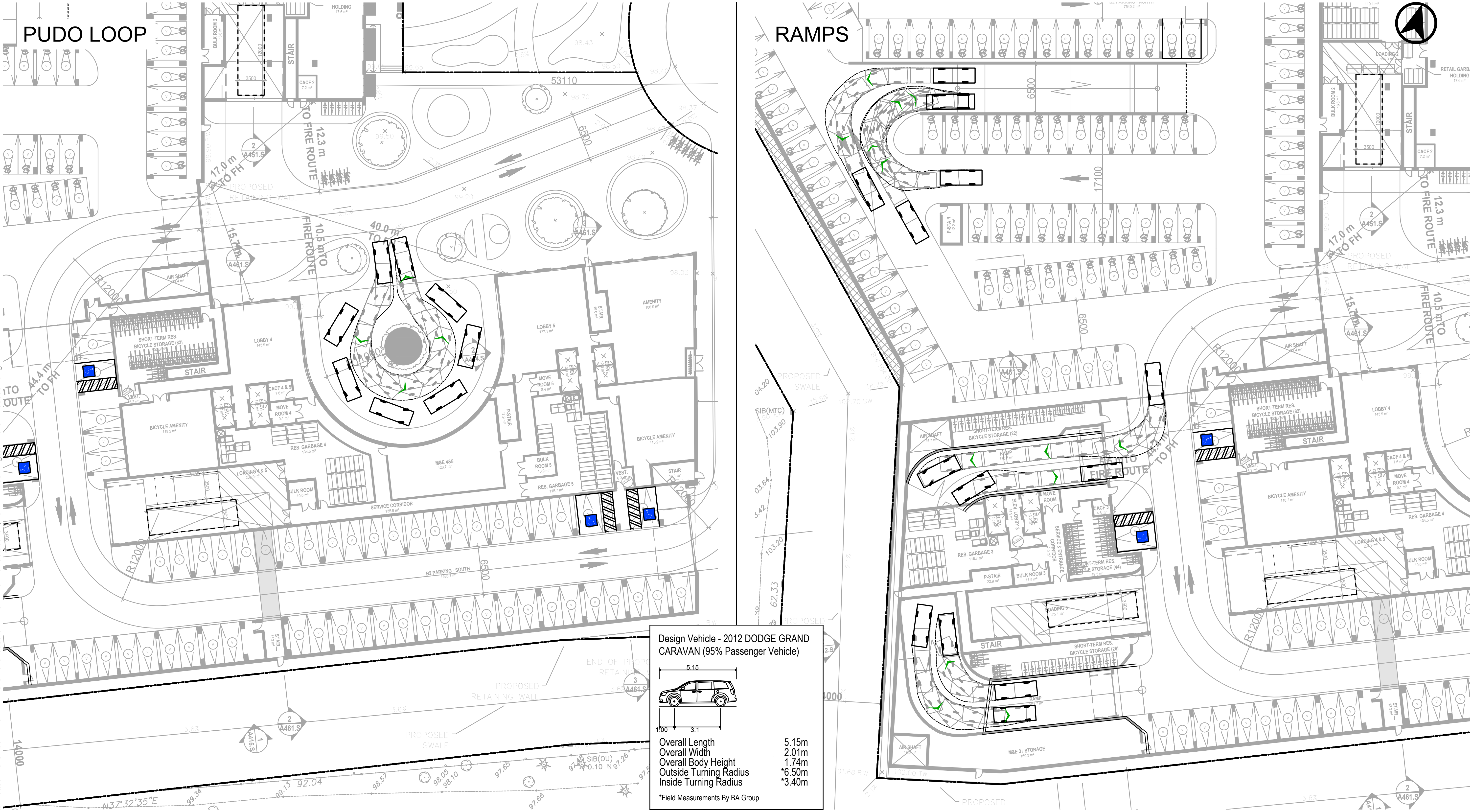
705 KINGSTON ROAD

VEHICLE MANOEUVRE DIAGRAM
BUILDING 4/5
CUBE VAN

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0, 5, 10, 15, 20m)

Drawing No. VMD-09



Design Vehicle - 2012 DODGE GRAND CARAVAN (95% Passenger Vehicle)

Overall Length	5.15m
Overall Width	2.01m
Overall Body Height	1.74m
Outside Turning Radius	*6.50m
Inside Turning Radius	*3.40m

*Field Measurements By BA Group

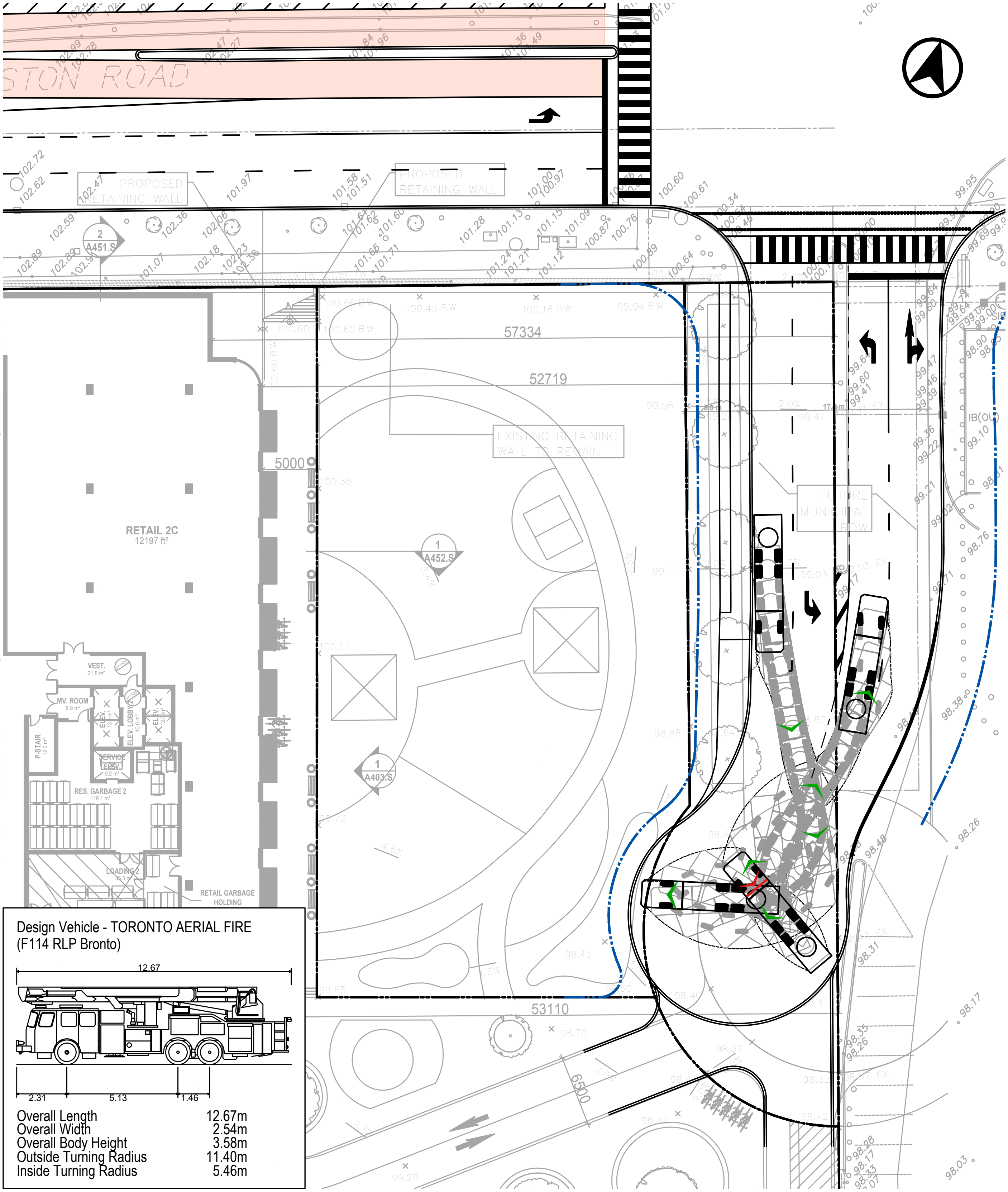
BA Group

705 KINGSTON ROAD
VEHICLE MANOEUVRE DIAGRAM
PICK UP DROP OFF LOOP AND RAMPS
DODGE GRAND CARAVAN

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--

Scale 1:500 (0, 5, 10, 15, 20m)

Drawing No. VMD-10



0 5 10 15 20m

1:500

Scale

Filename: J:\6589-67\BA\Functional Road Plan\2024\2. October 31-2024\BA-705 Kingston Rd-FD-658967-Interim-Oct31-2024.dwg

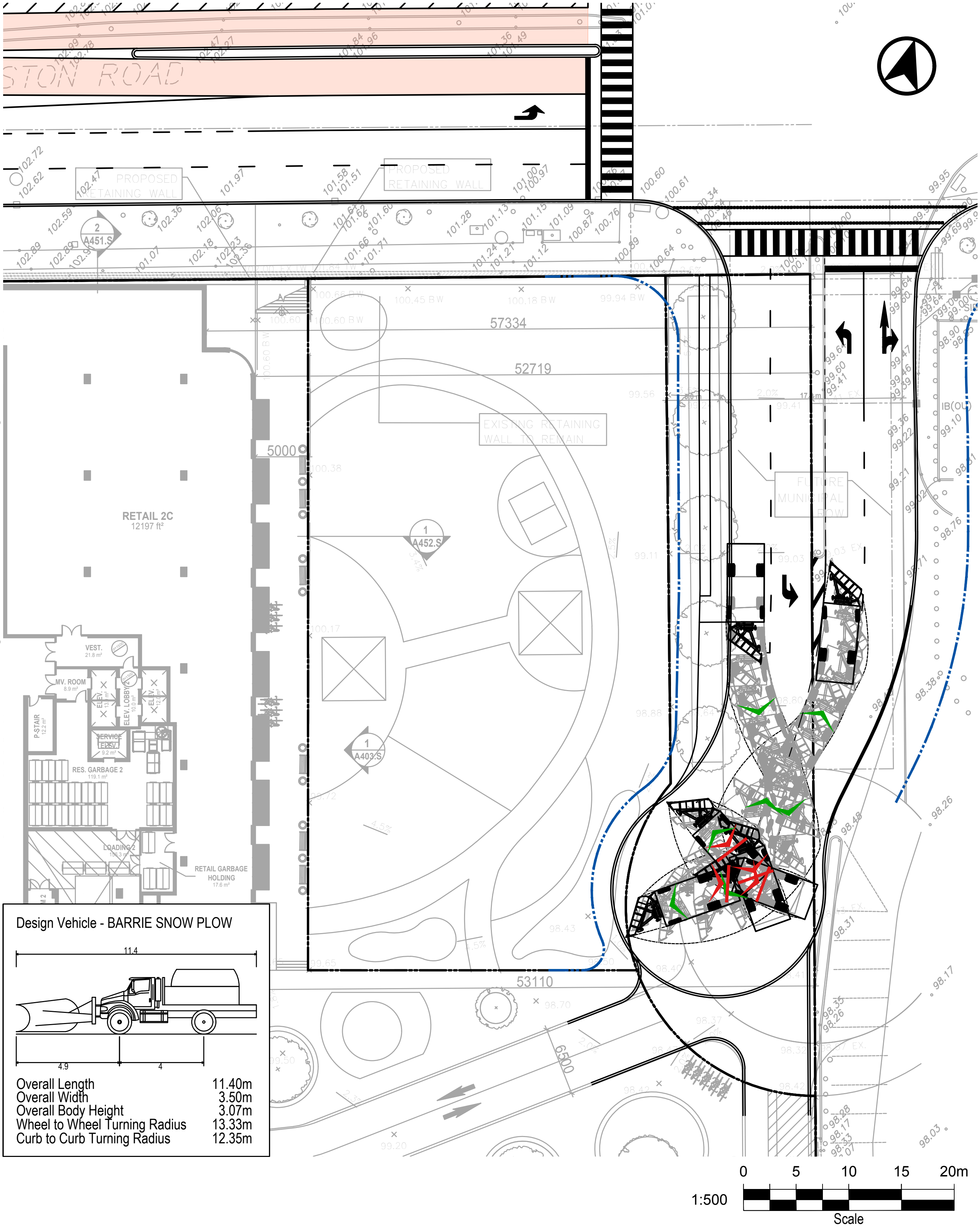
Date Plotted: November 1, 2024

BA Group

705 KINGSTON RD.

Vehicle Manoeuvring Diagram
Interim Cul-De-Sac Condition
Toronto Aerial Fire Truck (F114 RLP Bront)

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--
Drawing No.	VMD-11



Filename: J:\6589-67\BA\Functional Road Plan\2024\2. October 31-2024\BA-705 Kingston Rd-FD-658967-Interim-Oct31-2024.dwg

Date Plotted: November 1, 2024

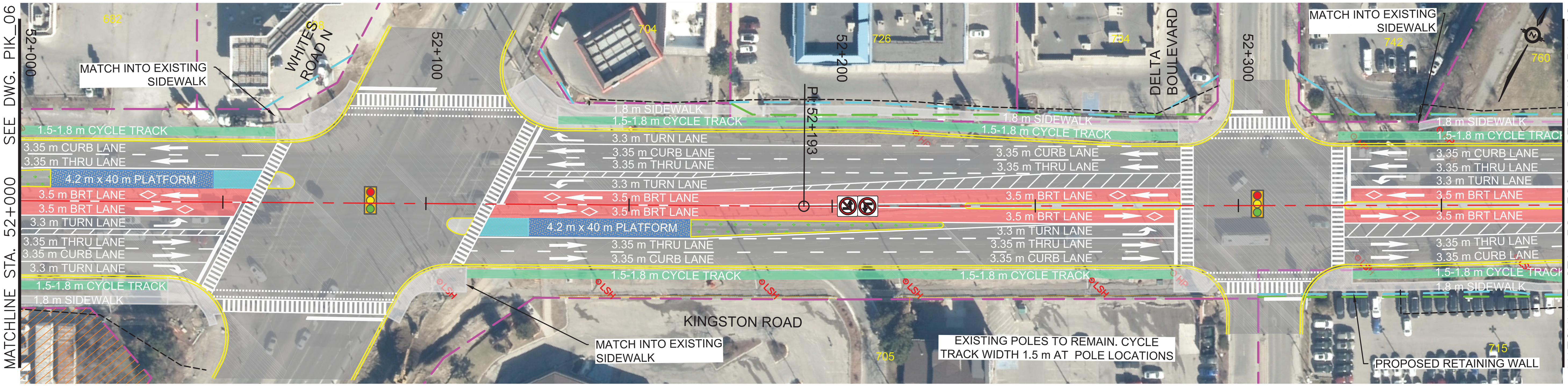
BA Group

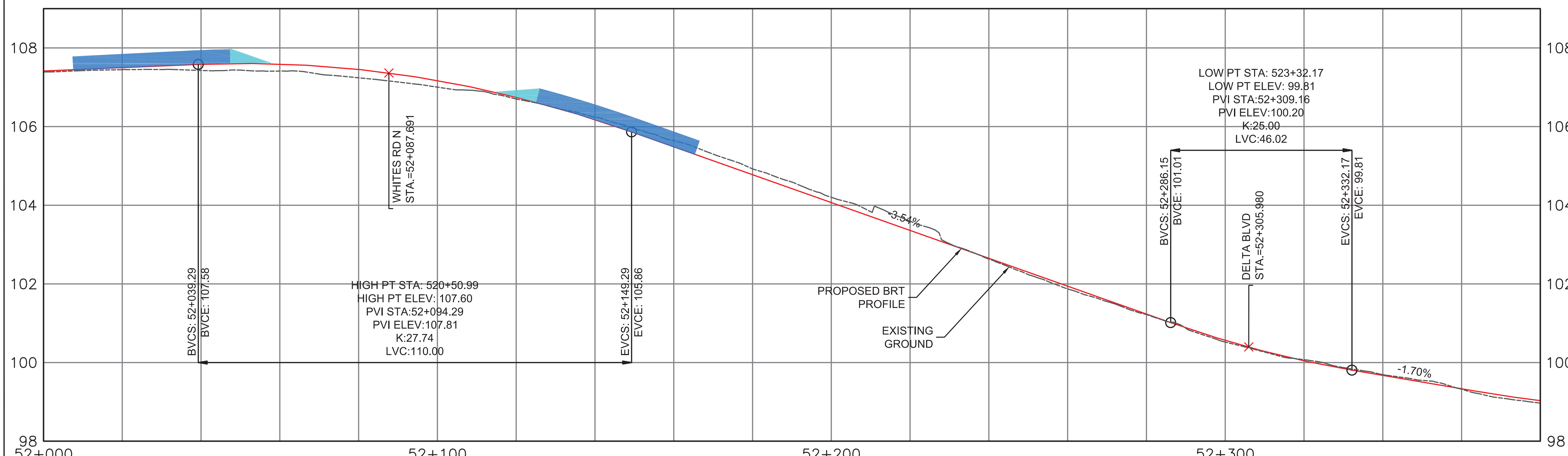
705 KINGSTON RD.

Vehicle Manoeuvring Diagram
Interim Cul-De-Sac Condition
Barrie Snow Plow

Project:	705 Kingston Road
Project No.	6589-67
Date:	November 1, 2024
Revised:	--
Drawing No.	VMD-12

Appendix F:
Durham-Scarborough Bus Rapid Transit 30% Preliminary Design – Whites Road to Delta Boulevard





ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

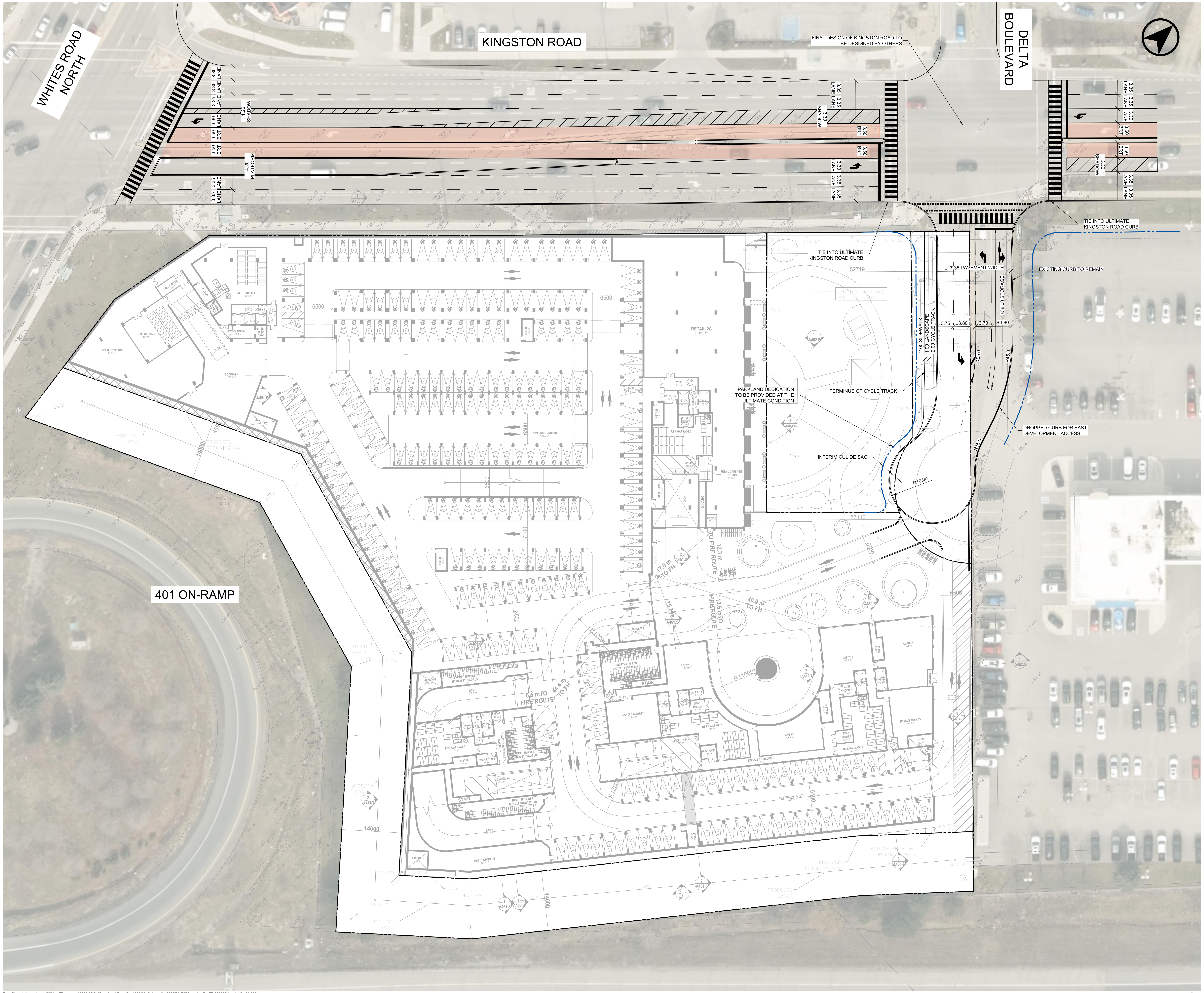
DRAWN BY: A.C 08/17/21	DESIGNED BY: M.H 08/17/21
CHECKED BY: M.H 08/17/21	APPROVED BY: M.P 08/17/21
SCALE: HOR 1:1000 VER 1:100	FULL SIZE ONLY 0 10 20m / 0 1 2m

TORONTO
DURHAM REGION
IBI
PARSONS
METROLINX
DurhamRegion Transit
DURHAM – SCARBOROUGH Bus Rapid Transit

DURHAM–SCARBOROUGH BUS RAPID TRANSIT
ENVIRONMENTAL ASSESSMENT
PLAN AND PROFILE
STA. 52+000 TO STA. 52+380

CONTRACT NO.	DWG. NO.	REV.	SHEET
RQQ–2018–PPDD–244	CPG_DSBRT_C0-200_PLAN&PROFILE_PIK	01	PIK_07

Appendix G:
Functional Road Plan



LEGEND

PROPOSED PROPERTY LINE

00 MM-DD-YR INT REVISION NOTE

BA Group

MOVEMENT IN URBAN ENVIRONMENTS

BAGROUP.COM

705 KINGSTON ROAD

FUNCTIONAL ROAD PLAN

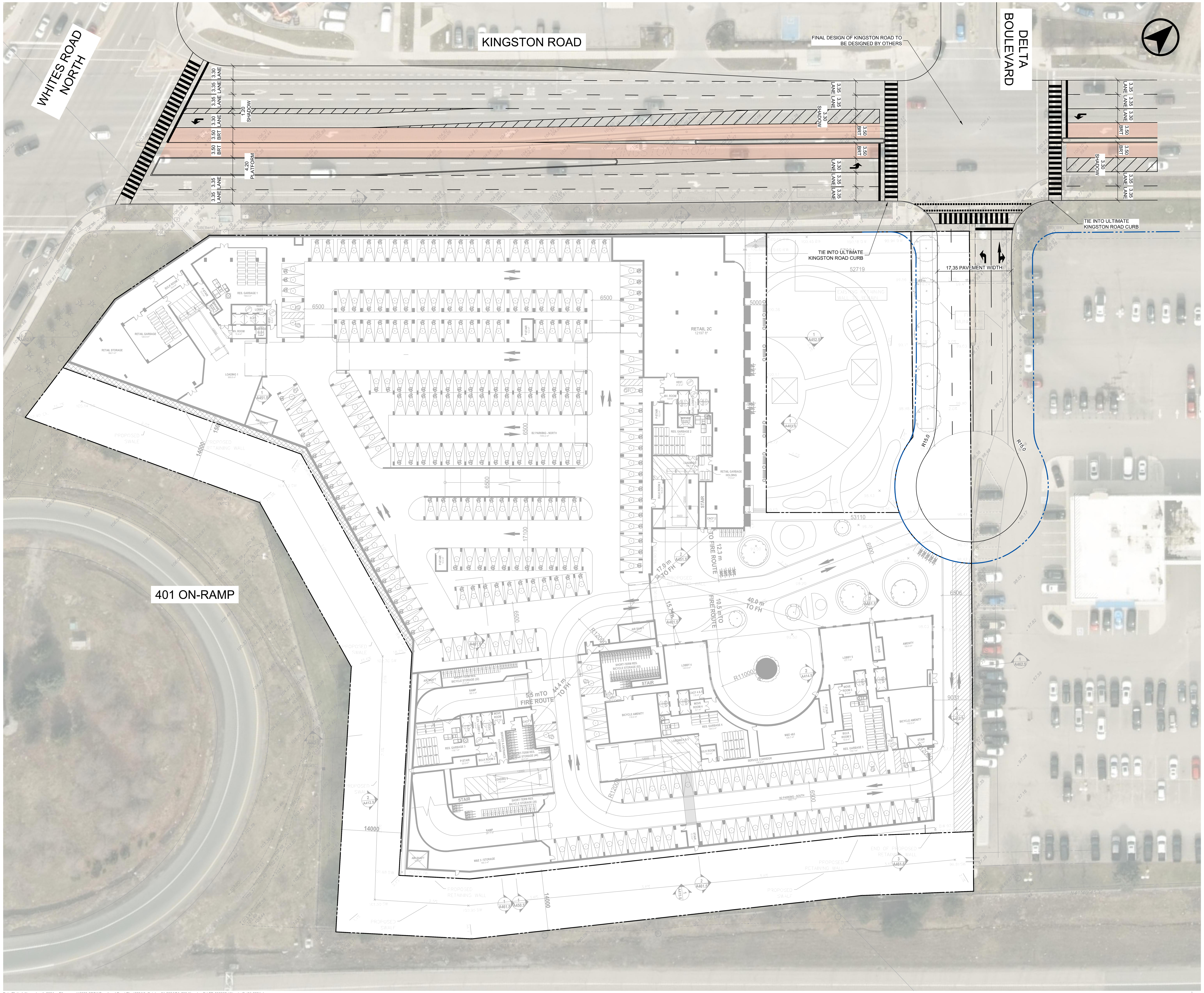
INTERIM CONDITION

Date: November 1, 2024

Project No.: 6589-67

Scale: 1:400

FD-01



LEGEND

PROPOSED PROPERTY LINE

00	MM-DD-YR	INT	REVISION NOTE

BA Group

BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL 416 961 7110
EMAIL bagroup@bagroup.com

MOVEMENT IN URBAN ENVIRONMENTS
BAGROUP.COM

705 KINGSTON ROAD

FUNCTIONAL ROAD PLAN

ULTIMATE CONDITION

Date: November 1, 2024

Project No.: 6589-67

Scale: 1:400

FD-02

Appendix H:
Internal Trip Capture

Edit Yellow Cells

WEEKDAY MORNING PEAK HOUR

Step 1: Determine if methodology is appropriate for the site
Step 2: Estimate trip generation for individual uses

Internal Trip Capture Estimation Tool			
Project Name:	705 Kingston Road	Organization:	BA Group
Project Location:	Kingston Road / Whites Road North	Performed By:	NHY
Scenario Description:	Internal Trip Generation - SITE	Date:	2024-10-29
HORIZON	2029/2034/2039	Checked By:	
Analysis Period:	AM Peak Hour	Date:	

Table 1-A: Base Person-Trip Generation Estimates (By Land Use)

Land Use	Development Data							
	Quantity	Units	Inbound Rate	Outbound Rate	Source	Inbound Persons	Outbound Persons	2-Way
Office								0
Retail					ITE Rate	60	40	100
Restaurant								0
Cinema/Entertainment								0
Residential					Proxy Rate	175	610	785
Hotel								
Community Centre					ITE Rate			0
Total (All Land Uses)						**235**	**650**	**885**

Step 3: Estimate proximity between individual on-site land use pairs **(ONLY WEEKDAY PM PEAK HOUR)**

Table 3-A: Average Land Use Interchange Distances (Walking Distance Between Uses in FEET)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Community Centre						

Units = in feet

Notes:
*black cells = no proximity adjustment factors available for these pairs

Step 4: Estimate unconstrained internal trip capture rates with proximity adjustmen
Step 4a: Estimate base unconstrained internal trip capture rates

[%]: Internal Vehicle-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		28%	63%	0%	1%	20%
Retail	29%		13%	0%	14%	10%
Restaurant	31%	14%		0%	4%	
Cinema/Entertainment	0%	0%	0%		0%	
Residential	2%	1%	20%	0%		5%
Community Centre	20%	20%			20%	

[%]: Internal Vehicle-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		32%	23%	0%	0%	10%
Retail	4%		50%	0%	2%	10%
Restaurant	14%	8%		0%	5%	
Cinema/Entertainment	0%	0%	0%		0%	
Residential	3%	17%	20%	0%		30%
Community Centre	5%	5%			50%	

Step 4b: Apply proximity-adjustment factors

Proximity Factors (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		1	1	1	1	1
Retail	1		1	1	1	1
Restaurant	1	1		1	1	1
Cinema/Entertainment	1	1	1		1	1
Residential	1	1	1	1		1
Community Centre	1	1	1	1	1	

Proximity Factors (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		1	1	1	1	1
Retail	1		1	1	1	1
Restaurant	1	1		1	1	1
Cinema/Entertainment	1	1	1		1	1
Residential	1	1	1	1		1
Community Centre	1	1	1	1	1	

Proximity Adjusted Factors (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		28%	63%	0%	1%	20%
Retail	29%		13%	0%	14%	10%
Restaurant	31%	14%		0%	4%	0%
Cinema/Entertainment	0%	0%	0%		0%	0%
Residential	2%	1%	20%	0%		5%
Community Centre	20%	20%	0%	0%	0%	

Proximity Adjusted Factors (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		32%	23%	0%	0%	10%
Retail	4%		50%	0%	2%	10%
Restaurant	14%	8%		0%	5%	0%
Cinema/Entertainment	0%	0%	0%		0%	0%
Residential	3%	17%	20%	0%		30%
Community Centre	5%	5%	0%	0%	50%	

Step 5: Estimate unconstrained demand between on-site land use pairs

TRIPS (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		0	0	0	0	0
Retail	10		5	0	5	5
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	10	5	120	0		30
Community Centre	0	0	0	0	0	

TRIPS (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		20	0	0	0	0
Retail	0		0	0	5	0
Restaurant	0	5		0	10	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	10	0	0		0
Community Centre	0	5	0	0	90	

Step 6: Estimate balanced demand between on-site land use pairs
Step 7: Estimate Total Internal Trips

BALANCED INTERNAL TRIPS

Origin (From)	Balanced / TO						
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre	**∑Origins >**
Office		0	0	0	0	0	0
Retail	0		0	0	5	0	5
Restaurant	0	0		0	0	0	0
Cinema/Entertainment	0	0	0		0	0	0
Residential	0	5	0	0		0	5
Community Centre	0	0	0	0	0		0
∑Destinations v	0	5	0	0	5	0	OK

INTERACTIONS	In	Out	2-Way
Retail	5	5	10
Residential	5	5	10

WEEKDAY AFTERNOON PEAK HOUR

Step 1: Determine if methodology is appropriate for the site
Step 2: Estimate trip generation for individual uses

Internal Trip Capture Estimation Tool			
Project Name:	705 Kingston Road	Organization:	BA Group
Project Location:	Kingston Road / Whites Road North	Performed By:	NHY
Scenario Description:	Internal Trip Generation - SITE	Date:	2024-10-29
HORIZON:	2029/2034/2039	Checked By:	
Analysis Period:	PM Peak Hour	Date:	

Table 1-A: Base Person-Trip Generation Estimates (By Land Use)

Land Use	Development Data							
	Quantity	Units	Inbound Rate	Outbound Rate	Source	Inbound Persons	Outbound Persons	2-Way
Office								0
Retail					ITE Rate	140	145	285
Restaurant								0
Cinema/Entertainment								0
Residential					Proxy Rate	435	350	785
Hotel								0
Community Centre								0
Total (All Land Uses)						**575**	**495**	**1070**

Step 3: Estimate proximity between individual on-site land use pairs **(ONLY WEEKDAY PM PEAK HOUR)**

Table 3-A: Average Land Use Interchange Distances (Walking Distance Between Uses in FEET)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office						250
Retail					250	250
Restaurant						
Cinema/Entertainment						
Residential		250				250
Community Centre						

Units = in feet

Notes:
*black cells = no proximity adjustment factors available for these pairs

If the proposed uses are in close proximity, this table can be left empty

Step 4: Estimate unconstrained internal trip capture rates with proximity adjustmen
Step 4a: Estimate base unconstrained internal trip capture rates

[%]: Internal Vehicle-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		20%	4%	0%	2%	10%
Retail	2%		29%	4%	26%	20%
Restaurant	3%	41%		8%	18%	
Cinema/Entertainment	2%	21%	31%		8%	
Residential	4%	42%	21%	0%		30%
Community Centre	10%	30%			30%	

[%]: Internal Vehicle-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		8%	2%	1%	4%	40%
Retail	31%		29%	26%	46%	10%
Restaurant	30%	50%		32%	16%	
Cinema/Entertainment	6%	4%	3%		4%	
Residential	57%	10%	14%	0%		20%
Community Centre	20%	20%			10%	

Step 4b: Apply proximity-adjustment factors

Proximity Factors (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		1	1	1	1	1
Retail	1		1	1	1	1
Restaurant	1	1		1	1	1
Cinema/Entertainment	1	1	1		1	1
Residential	1	0.9823	1	1		1
Community Centre	1	1	1	1	1	

Proximity Factors (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		1	1	1	1	1
Retail	1		1	1	1	1
Restaurant	1	1		1	1	1
Cinema/Entertainment	1	1	1		1	1
Residential	1	0.9823	1	1		1
Community Centre	1	1	1	1	1	

Proximity Adjusted Factors (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		20%	4%	0%	2%	10%
Retail	2%		29%	4%	26%	20%
Restaurant	3%	41%		8%	18%	0%
Cinema/Entertainment	2%	21%	31%		8%	0%
Residential	4%	41%	21%	0%		30%
Community Centre	10%	30%	0%	0%	30%	

Proximity Adjusted Factors (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		8%	2%	1%	4%	40%
Retail	31%		29%	26%	46%	10%
Restaurant	30%	50%		32%	16%	0%
Cinema/Entertainment	6%	4%	3%		4%	0%
Residential	57%	10%	14%	0%		20%
Community Centre	20%	20%	0%	0%	10%	

Step 5: Estimate unconstrained demand between on-site land use pairs

TRIPS (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		0	0	0	0	0
Retail	5		40	5	40	30
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	15	145	75	0		105
Community Centre	0	0	0	0	0	

TRIPS (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre
Office		10	0	0	15	0
Retail	0		0	0	200	0
Restaurant	0	70		0	70	0
Cinema/Entertainment	0	5	0		15	0
Residential	0	15	0	0		0
Community Centre	0	30	0	0	45	

Step 6: Estimate balanced demand between on-site land use pairs
Step 7: Estimate Total Internal Trips

BALANCED INTERNAL TRIPS

Origin (From)	Balanced / TO						
	Office	Retail	Restaurant	Cinema/Entertain	Residential	Community Centre	**∑Origins >**
Office		0	0	0	0	0	0
Retail	0		0	0	40	0	40
Restaurant	0	0		0	0	0	0
Cinema/Entertainment	0	0	0		0	0	0
Residential	0	15	0	0		0	15
Community Centre	0	0	0	0	0		0
∑Destinations v	0	15	0	0	40	0	OK

INTERACTIONS	In	Out	2-Way
Retail	15	40	55
Residential	40	15	55

Appendix I:
Transportation Tomorrow Survey Query Analysis

RESIDENTIAL

AM OUT

Tue Oct 08 2024 22:55:36 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA zone of origin - gta06_orig In 1038 1040 1041 1048
and
Trip purpose of origin - purp_orig In H)

Table: Trip 2016

Row:	Count:	Expanded:	TOTAL
Transit excluding GO rail	5	174	**4%**
Auto driver	111	2530	**64%**
GO rail only	12	163	**4%**
Joint GO rail and local transit	4	88	**2%**
Auto passenger	20	496	**13%**
School bus	6	215	**5%**
Walk	8	263	**7%**
Total:	166	3929	**100%**

Auto Drive	64.4%
Auto Pass	18.1%
Transit	10.8%
Cycling	0.0%
Walking	6.7%
Total	100.0%

PM IN

Tue Oct 08 2024 22:56:51 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA zone of destination - gta06_dest In 1038 1040 1041 1048
and
Trip purpose of destination - purp_dest In H)

Table: Trip 2016

Row:	Count:	Expanded	TOTAL
Transit excluding GO rail	8	320	**9%**
Cycle	1	15	**0%**
Auto driver	103	2204	**62%**
GO rail only	12	209	**6%**
Joint GO rail and local transit	4	93	**3%**
Auto passenger	14	349	**10%**
School bus	2	89	**3%**
Walk	10	277	**8%**
Total:	154	3556	**100%**

Auto Drive	62.0%
Auto Pass	12.3%
Transit	17.5%
Cycling	0.4%
Walking	7.8%
Total	100.0%

Linear interpolation from 2024 to 2041 targets

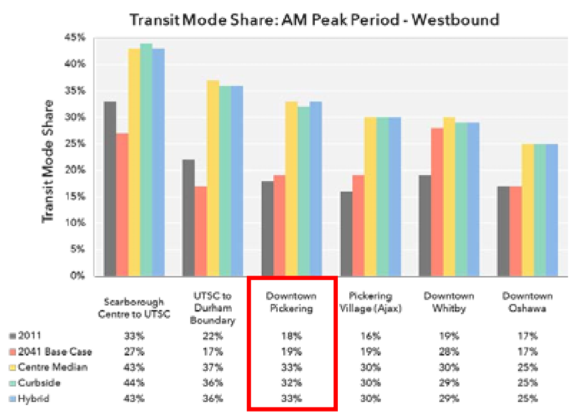
		2016	2024	2029	2034	2039	2041	Target
Auto Drive	63.2%	62.0%	57.2%	54.2%	51.2%	48.2%	47.0%	**47%**
Auto Pass	15.2%	16.0%	14.7%	13.9%	13.1%	12.3%	12.0%	**12%**
Transit	14.2%	14.0%	20.1%	23.9%	27.7%	31.5%	33.0%	**33%**
Cycling	0.2%	0.0%	1.0%	1.0%	1.0%	1.0%	1.0%	
Walking	7.2%	8.0%	7.0%	7.0%	7.0%	7.0%	7.0%	
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Rate of transit mode share increase (up to 33% at 2041):
0.76% per year (also equivalent to rate of auto mode decrease)
driver 0.60% per year decrease
passenge 0.16% per year decrease

	2024	2029	2034	2039	2041	Diff (2041-2024)
Auto Driver	57.0%	54.0%	51.0%	48.0%	47.0%	-10.0%
Auto Passenger	15.0%	14.0%	13.0%	12.0%	12.0%	-3.0%
Transit	20.0%	24.0%	28.0%	32.0%	33.0%	13.0%
Cycling	1.0%	1.0%	1.0%	1.0%	1.0%	0.0%
Walking	7.0%	7.0%	7.0%	7.0%	7.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://assets.metrolinx.com/image/upload/v1663237565/Documents/Metrolinx/2019-01-24-DSBRT_Final-for-Publication_updated.pdf

Exhibit 5.6: Transit Mode Shares (2 hour AM Peak Period – Westbound)



RETAIL

DAILY IN

Fri May 31 2024 13:52:39 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-1759
and
Trip purpose of destination - purp_dest In M
and
2006 GTA zone of destination - gta06_dest In 1046-1049)

Table: Trip 2016

Row:	Count:	Expanded:	**Total**
Auto driver	66	1229	**81%**
Auto passenger	13	288	**19%**
Total:	79	1517	**100%**

Auto Drive	81.0%
Auto Pass	19.0%
Transit	
Cycling	
Walking	
Total	100.0%

DAILY OUT

Fri May 31 2024 13:53:28 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-1759
and
Trip purpose of origin - purp_orig In M
and
2006 GTA zone of origin - gta06_orig In 1046-1049)

Table: Trip 2016

Row:	Count:	Expanded	**Total**
Auto driver	61	1088	**84%**
Auto passenger	12	205	**16%**
Total:	73	1293	**100%**

Auto Drive	84.1%
Auto Pass	15.9%
Transit	0.0%
Cycling	0.0%
Walking	0.0%
Total	100.0%

Auto Drive	82.6%	80.0%
Auto Pass	17.4%	20.0%
Transit	0.0%	0.0%
Cycling	0.0%	0.0%
Walking	0.0%	0.0%
Total	100.0%	100.0%

Mon Jun 03 2024 21:53:08 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-1759
and
Trip purpose of destination - purp_dest In M
and
2006 GTA zone of destination - gta06_dest In 1041-104: 1046-1049)

Table: Trip 2016

Row:	Count:	Expanded	**Total**
Transit excluding GO rail	13	293	**4%**
Cycle	1	9	**0%**
Auto driver	353	6164	**77%**
GO rail only	1	21	**0%**
Auto passenger	81	1450	**18%**
Walk	4	68	**1%**
Total:	453	8004	**100%**

Auto Drive	77.0%
Auto Pass	18.1%
Transit	3.9%
Cycling	0.1%
Walking	0.8%
Total	100.0%

Mon Jun 03 2024 21:51:12 GMT-0400 (Eastern Daylight Time)

Frequency Distribution Query Form - Trip - 2016

Field: Primary travel mode of trip - mode_prime

Filters:
(Start time of trip - start_time In 600-1759
and
Trip purpose of origin - purp_orig In M
and
2006 GTA zone of origin - gta06_orig In 1041-1042 1046-1049)

Table: Trip 2016

Row:	Count:	Expanded	**Total**
Transit excluding GO rail	13	293	**4%**
Cycle	1	9	**0%**
Auto driver	328	5605	**77%**
GO rail only	1	6	**0%**
Auto passenger	78	1287	**18%**
Walk	3	46	**1%**
Total:	424	7246	**100%**

Auto Drive	77.4%
Auto Pass	17.8%
Transit	4.1%
Cycling	0.1%
Walking	0.6%
Total	100.0%

Linear interpolation from 2024 to 2041 targets
(2024 assume same as 2016)

		2016	2024	2029	2034	2039	2041
Auto Drive	77.2%	77.0%	77.0%	74.4%	71.8%	69.2%	68.2%
Auto Pass	17.9%	18.0%	18.0%	17.4%	16.7%	16.1%	15.8%
Transit	4.0%	4.0%	4.0%	4.2%	7.5%	10.7%	12.0%
Cycling	0.1%	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%
Walking	0.7%	1.0%	1.0%	3.0%	3.0%	3.0%	3.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Rate of transit mode share increase (up to 15% at 2041):

	0.65%	per year (also equivalent to rate of auto mode decrease)
driver	0.52%	per year decrease
passenge	0.13%	per year decrease

	2024	2029	2034	2039	2041	Diff (2041-2024)
Auto Driver	77%	74%	72%	69%	68%	-9.0%
Auto Passenger	18%	18%	17%	16%	16%	-2.0%
Transit	4%	4%	7%	11%	12%	8.0%
Cycling	0%	1%	1%	1%	1%	1.0%
Walking	1%	3%	3%	3%	3%	2.0%
Total	100%	100%	100%	100%	100%	

Thu May 30 2024 10:28:49 GMT-0400 (Eastern Daylight Time) - Run Time: 2592ms

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA 1040
and
Trip purpose of origin - purp_orig In H
and
Primary tra M P T U)

Trip 2016
Table:

	1038	1040	TOTAL
PD 1 of To	73	0	73
PD 3 of To	69	0	69
PD 4 of To	10	0	10
PD 5 of To	58	0	58
PD 6 of To	0	21	21
PD 10 of T	36	22	58
PD 11 of T	29	0	29
PD 12 of T	86	0	86
PD 13 of T	143	40	183
PD 15 of T	85	9	94
PD 16 of T	131	65	196
Pickering	790	148	938
Ajax	121	155	276
Whitby	20	0	20
Oshawa	87	19	106
Aurora	46	0	46
Whitchurch	0	33	33
Markham	111	116	227
Vaughan	86	122	208
Mississaug	43	0	43
Flamborou	0	30	30

Thu May 30 2024 10:44:11 GMT-0400 (Eastern Daylight Time) - Run Time: 2704ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(Start time of trip - start_time In 600-859
and
2006 GTA 1040
and
Trip purpose of origin - purp_orig In H
and
Primary tra M P T U
and
Planning di)

Trip 2016
Table:

	1038	1040	TOTAL
1024	10	0	10
1031	182	54	236
1035	305	0	305
1037	43	0	43
1038	42	0	42
1041	41	10	51
1042	16	0	16
1043	50	11	61
1045	25	0	25
1046	44	23	67
1051	19	41	60
1053	0	8	8
1056	14	0	14

PD 1 of Toronto	73
PD 3 of Toronto	69
PD 4 of Toronto	10
PD 5 of Toronto	58
PD 6 of Toronto	21
PD 10 of Toronto	58
PD 11 of Toronto	29
PD 12 of Toronto	86
PD 13 of Toronto	183
PD 15 of Toronto	94
PD 16 of Toronto	196
Ajax	276
Whitby	20
Oshawa	106
Aurora	46
Whitchurch-Stouffville	33
Markham	227
Vaughan	208
Mississauga	43
Flamborough	30
1024	10
1031	236
1035	305
1037	43
1038	42
1041	51
1042	16
1043	61
1045	25
1046	67
1051	60
1053	8
1056	14

Thu May 30 2024 10:48:07 GMT-0400 (Eastern Daylight Time) - Run Time: 2556ms

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA 1040
and
Trip purpose of destination - purp_dest In H
and
Primary tra M P T U)

Trip 2016
Table:

	1038	1040	TOTAL
PD 1 of To	101	0	101
PD 2 of To	19	0	19
PD 3 of To	10	0	10
PD 5 of To	65	0	65
PD 6 of To	0	21	21
PD 12 of T	73	26	99
PD 13 of T	113	214	327
PD 15 of T	32	0	32
PD 16 of T	166	0	166
Pickering	561	173	734
Ajax	144	113	257
Whitby	10	13	23
Oshawa	73	0	73
Aurora	21	0	21
Whitchurcl	26	33	59
Markham	121	126	247
Vaughan	67	51	118
Muskoka	19	0	19

Thu May 30 2024 10:47:23 GMT-0400 (Eastern Daylight Time) - Run Time: 2821ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(Start time of trip - start_time In 1500-1759
and
2006 GTA 1040
and
Trip purpose of destination - purp_dest In H
and
Primary tra M P T U
and
Planning di)

Trip 2016
Table:

	1038	1040	TOTAL
1018	14	0	14
1028	0	10	10
1031	28	54	82
1035	184	0	184
1036	14	0	14
1037	19	0	19
1038	14	0	14
1039	7	0	7
1040	25	0	25
1041	96	13	109
1043	50	0	50
1045	45	0	45
1046	51	23	74
1051	14	65	79
1053	0	8	8

PD 1 of Toronto	101
PD 2 of Toronto	19
PD 3 of Toronto	10
PD 5 of Toronto	65
PD 6 of Toronto	21
PD 12 of Toronto	99
PD 13 of Toronto	327
PD 15 of Toronto	32
PD 16 of Toronto	166
Ajax	257
Whitby	23
Oshawa	73
Aurora	21
Whitchurch-Stouffville	59
Markham	247
Vaughan	118
Muskoka	19
1018	14
1028	10
1031	82
1035	184
1036	14
1037	19
1038	14
1039	7
1040	25
1041	109
1043	50
1045	45
1046	74
1051	79
1053	8

AM	RESIDENTIAL VEHICLE TRIP DISTRIBUTION
Outbound	Traffic Volume Allocation
2024-10-29	

Pickering

Zone	Trips	%	EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
PD 1 of Toronto	73	2.65%				100%							100.00%
PD 3 of Toronto	69	2.51%				100%							100.00%
PD 4 of Toronto	10	0.36%				100%							100.00%
PD 5 of Toronto	58	2.11%				100%							100.00%
PD 6 of Toronto	21	0.76%				100%							100.00%
PD 10 of Toronto	58	2.11%				100%							100.00%
PD 11 of Toronto	29	1.05%				100%							100.00%
PD 12 of Toronto	86	3.12%				100%							100.00%
PD 13 of Toronto	183	6.65%			30%	70%							100.00%
PD 15 of Toronto	94	3.41%			50%	50%							100.00%
PD 16 of Toronto	196	7.12%			50%	50%							100.00%
Ajax	276	10.03%	50%	50%									100.00%
Whitby	20	0.73%	30%	70%									100.00%
Oshawa	106	3.85%		100%									100.00%
Aurora	46	1.67%				20%	40%		40%				100.00%
Whitchurch-Stouffville	33	1.20%				20%	40%		40%				100.00%
Markham	227	8.25%					60%		40%				100.00%
Vaughan	208	7.56%				100%							100.00%
Mississauga	43	1.56%				100%							100.00%
Flamborough	30	1.09%				100%							100.00%
1024	10	0.36%			50%		50%						100.00%
1031	236	8.57%						40%	40%	20%			100.00%
1035	305	11.08%					50%	30%	20%				100.00%
1037	43	1.56%					30%	35%	35%				100.00%
1038	42	1.53%					35%	35%	30%				100.00%
1042	16	0.58%	100%										100.00%
1043	61	2.22%	100%										100.00%
1045	25	0.91%	100%										100.00%
1046	67	2.43%			50%		50%						100.00%
1051	60	2.18%										100%	100.00%
1053	8	0.29%										100%	100.00%
1056	14	0.51%									50%	50%	100.00%
TOTAL	**2753**	**100%**											

EAST Kingston Rd	EAST Highway 401	WEST Kingston Rd	WEST Highway 401	NORTH Whites Rd N	NORTH Fairport Rd	NORTH Dixie Rd	NORTH Liverpool Rd	SOUTH Whites Rd N	SOUTH Liverpool Rd	TOTAL
0.00%	0.00%	0.00%	2.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.65%
0.00%	0.00%	0.00%	2.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.51%
0.00%	0.00%	0.00%	0.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%
0.00%	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.11%
0.00%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.76%
0.00%	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.11%
0.00%	0.00%	0.00%	1.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%
0.00%	0.00%	0.00%	3.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.12%
0.00%	0.00%	1.99%	4.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.65%
0.00%	0.00%	1.71%	1.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.41%
0.00%	0.00%	3.56%	3.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.12%
5.01%	5.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.03%
0.22%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.73%
0.00%	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.85%
0.00%	0.00%	0.00%	0.33%	0.67%	0.00%	0.67%	0.00%	0.00%	0.00%	1.67%
0.00%	0.00%	0.00%	0.24%	0.48%	0.00%	0.48%	0.00%	0.00%	0.00%	1.20%
0.00%	0.00%	0.00%	0.00%	4.95%	0.00%	3.30%	0.00%	0.00%	0.00%	8.25%
0.00%	0.00%	0.00%	7.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.56%
0.00%	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.56%
0.00%	0.00%	0.00%	1.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.09%
0.00%	0.00%	0.18%	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%
0.00%	0.00%	0.00%	0.00%	0.00%	3.43%	3.43%	1.71%	0.00%	0.00%	8.57%
0.00%	0.00%	0.00%	0.00%	5.54%	3.32%	2.22%	0.00%	0.00%	0.00%	11.08%
0.00%	0.00%	0.00%	0.00%	0.47%	0.55%	0.55%	0.00%	0.00%	0.00%	1.56%
0.00%	0.00%	0.00%	0.00%	0.53%	0.53%	0.46%	0.00%	0.00%	0.00%	1.53%
0.58%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.58%
2.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%
0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%
0.00%	0.00%	1.22%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	2.43%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.18%	2.18%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%	0.29%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	0.25%	0.51%
8.9%	**9.4%**	**8.7%**	**35.4%**	**14.0%**	**7.8%**	**11.1%**	**1.7%**	**0.3%**	**2.7%**	**100.0%**
10.0%	**10.0%**	**10.0%**	**30.0%**	**15.0%**	**5.0%**	**10.0%**	**5.0%**	**0.0%**	**5.0%**	**100.0%**

North	35.0%
South	5.0%
East	20.0%
West	40.0%
	100.0%

PM	RESIDENTIAL VEHICLE TRIP DISTRIBUTION
Inbound	Traffic Volume Allocation
2024-10-29	

				EAST	EAST	WEST	WEST	NORTH	NORTH	NORTH	NORTH	SOUTH	SOUTH	
	Zone	Trips	%	Kingston Rd	Highway 401	Kingston Rd	Highway 401	Whites Rd N	Fairport Rd	Dixie Rd	Liverpool Rd	Whites Rd N	Liverpool Rd	TOTAL
	PD 1 of Toronto	101	4.43%				100%							100.00%
	PD 2 of Toronto	19	0.83%				100%							100.00%
	PD 3 of Toronto	10	0.44%				100%							100.00%
	PD 5 of Toronto	65	2.85%				100%							100.00%
	PD 6 of Toronto	21	0.92%				100%							100.00%
	PD 12 of Toronto	99	4.34%				100%							100.00%
	PD 13 of Toronto	327	14.33%			30%	70%							100.00%
	PD 15 of Toronto	32	1.40%			50%	50%							100.00%
	PD 16 of Toronto	166	7.27%			50%	50%							100.00%
	Ajax	257	11.26%	50%	50%									100.00%
	Whitby	23	1.01%	30%	70%									100.00%
	Oshawa	73	3.20%		100%									100.00%
	Aurora	21	0.92%				20%	40%		40%				100.00%
	Whitchurch-Stouffville	59	2.59%				20%	40%		40%				100.00%
	Markham	247	10.82%					60%		40%				100.00%
	Vaughan	118	5.17%				100%							100.00%
	Muskoka	19	0.83%				20%			40%	40%			100.00%
Pickering	1018	14	0.61%	50%							50%			100.00%
	1028	10	0.44%							50%	50%			100.00%
	1031	82	3.59%						40%	40%	20%			100.00%
	1035	184	8.06%					50%	30%	20%				100.00%
	1036	14	0.61%					100%						100.00%
	1037	19	0.83%					30%	35%	35%				100.00%
	1038	14	0.61%					35%	35%	30%				100.00%
	1039	7	0.31%	40%						20%	40%			100.00%
	1040	25	1.10%							50%	50%			100.00%
	1043	50	2.19%	100%										100.00%
	1045	45	1.97%	100%										100.00%
	1046	74	3.24%			50%		50%						100.00%
	1051	79	3.46%										100%	100.00%
	1053	8	0.35%										100%	100.00%
	TOTAL	**2282**	**100%**											

EAST	EAST	WEST	WEST	NORTH	NORTH	NORTH	NORTH	SOUTH	SOUTH	
Kingston Rd	Highway 401	Kingston Rd	Highway 401	Whites Rd N	Fairport Rd	Dixie Rd	Liverpool Rd	Whites Rd N	Liverpool Rd	TOTAL
0.00%	0.00%	0.00%	4.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.43%
0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.83%
0.00%	0.00%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%
0.00%	0.00%	0.00%	2.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.85%
0.00%	0.00%	0.00%	0.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%
0.00%	0.00%	0.00%	4.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.34%
0.00%	0.00%	4.30%	10.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.33%
0.00%	0.00%	0.70%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%
0.00%	0.00%	3.64%	3.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.27%
5.63%	5.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.26%
0.30%	0.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%
0.00%	3.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
0.00%	0.00%	0.00%	0.18%	0.37%	0.00%	0.37%	0.00%	0.00%	0.00%	0.92%
0.00%	0.00%	0.00%	0.52%	1.03%	0.00%	1.03%	0.00%	0.00%	0.00%	2.59%
0.00%	0.00%	0.00%	0.00%	6.49%	0.00%	4.33%	0.00%	0.00%	0.00%	10.82%
0.00%	0.00%	0.00%	5.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.17%
0.00%	0.00%	0.00%	0.17%	0.00%	0.00%	0.33%	0.33%	0.00%	0.00%	0.83%
0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	0.61%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%	0.22%	0.00%	0.00%	0.44%
0.00%	0.00%	0.00%	0.00%	0.00%	1.44%	1.44%	0.72%	0.00%	0.00%	3.59%
0.00%	0.00%	0.00%	0.00%	4.03%	2.42%	1.61%	0.00%	0.00%	0.00%	8.06%
0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%
0.00%	0.00%	0.00%	0.00%	0.25%	0.29%	0.29%	0.00%	0.00%	0.00%	0.83%
0.00%	0.00%	0.00%	0.00%	0.21%	0.21%	0.18%	0.00%	0.00%	0.00%	0.61%
0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.06%	0.12%	0.00%	0.00%	0.31%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.55%	0.55%	0.00%	0.00%	1.10%
2.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.19%
1.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.97%
0.00%	0.00%	1.62%	0.00%	1.62%	0.00%	0.00%	0.00%	0.00%	0.00%	3.24%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.46%	3.46%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.35%	0.35%
10.5%	**9.5%**	**10.3%**	**34.2%**	**14.6%**	**4.4%**	**10.4%**	**2.2%**	**0.0%**	**3.8%**	**100.0%**

10.0%	**10.0%**	**10.0%**	**30.0%**	**15.0%**	**5.0%**	**10.0%**	**5.0%**	**0.0%**	**5.0%**	**100.0%**

North	35.0%
South	5.0%
East	20.0%
West	40.0%
	100.0%

Appendix J:
Existing Traffic Movement Counts

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (1 . KINGSTON RD & WHITES RD)

Start Time	N Approach WHITES RD						E Approach KINGSTON RD						S Approach WHITES RD						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	7	219	15	0	3	241	47	82	49	0	3	178	37	91	31	0	0	159	37	32	8	1	3	78	656	
07:15:00	13	237	11	0	4	261	55	84	63	0	3	202	59	92	35	0	1	186	56	28	7	0	3	91	740	
07:30:00	14	253	19	0	4	286	64	102	56	0	3	222	76	77	31	0	0	184	68	42	8	0	0	118	810	
07:45:00	22	302	18	1	1	343	70	119	78	0	2	267	101	110	30	0	3	241	80	56	14	0	2	150	1001	3207
08:00:00	25	319	44	1	3	389	73	130	73	0	5	276	79	124	53	0	1	256	77	53	19	0	2	149	1070	3621
08:15:00	18	259	33	1	4	311	69	150	83	0	1	302	91	102	40	1	0	234	90	58	14	1	0	163	1010	3891
08:30:00	26	293	26	0	6	345	108	156	70	0	5	334	83	95	39	0	3	217	98	75	19	0	3	192	1088	4169
08:45:00	38	262	36	1	6	337	76	163	65	0	7	304	120	127	45	0	3	292	94	94	23	1	4	212	1145	4313
09:00:00	40	230	35	0	3	305	94	135	67	0	9	296	110	105	51	0	1	266	83	74	21	0	3	178	1045	4288
09:15:00	49	225	39	2	12	315	94	120	49	0	8	263	83	137	45	0	4	265	60	89	37	0	14	186	1029	4307
09:30:00	30	237	54	1	2	322	66	125	62	0	2	253	90	66	36	0	9	192	61	92	22	0	12	175	942	4161
09:45:00	26	185	40	1	9	252	59	116	46	0	5	221	123	61	41	0	4	225	67	91	18	0	2	176	874	3890
BREAK																										
16:00:00	26	176	48	0	7	250	123	201	58	0	9	382	211	200	60	0	3	471	104	177	40	0	3	321	1424	
16:15:00	51	141	43	0	3	235	116	189	63	0	4	368	208	273	63	0	9	544	97	200	45	0	7	342	1489	
16:30:00	30	159	43	0	12	232	160	204	63	0	8	427	199	241	63	0	4	503	89	186	54	0	2	329	1491	
16:45:00	44	155	42	0	3	241	135	177	61	0	4	373	209	279	68	0	14	556	103	202	39	1	16	345	1515	5919
17:00:00	33	201	47	0	5	281	137	230	71	0	3	438	207	226	63	0	5	496	103	185	35	2	4	325	1540	6035
17:15:00	42	177	42	0	10	261	142	191	69	0	7	402	204	290	67	0	1	561	81	178	42	1	2	302	1526	6072
17:30:00	40	208	41	0	1	289	125	211	48	1	1	385	222	261	68	0	4	551	74	158	50	0	5	282	1507	6088
17:45:00	35	185	49	0	6	269	132	153	60	1	5	346	200	259	63	0	2	522	93	150	36	2	1	281	1418	5991
18:00:00	32	205	52	0	9	289	124	173	72	0	6	369	184	207	63	0	4	454	109	137	38	1	3	285	1397	5848
18:15:00	21	186	47	0	2	254	107	151	66	0	5	324	174	200	54	0	4	428	69	163	32	1	5	265	1271	5593
18:30:00	25	177	44	1	6	247	112	162	70	0	2	344	182	198	46	0	3	426	76	115	27	0	1	218	1235	5321
18:45:00	37	165	49	0	3	251	141	174	51	0	2	366	188	196	43	1	5	428	87	140	37	2	3	266	1311	5214
Grand Total	724	5156	917	9	124	6806	2429	3698	1513	2	109	7642	3440	4017	1198	2	87	8657	1956	2775	685	13	100	5429	**28534**	-
Approach%	10.6%	75.8%	13.5%	0.1%		-	31.8%	48.4%	19.8%	0%		-	39.7%	46.4%	13.8%	0%		-	36%	51.1%	12.6%	0.2%		-	-	-
Totals %	2.5%	18.1%	3.2%	0%		23.9%	8.5%	13%	5.3%	0%		26.8%	12.1%	14.1%	4.2%	0%		30.3%	6.9%	9.7%	2.4%	0%		19%	-	-
Heavy	10	93	10	0		-	43	85	21	0		-	63	67	11	0		-	28	70	7	0		-	-	-
Heavy %	1.4%	1.8%	1.1%	0%		-	1.8%	2.3%	1.4%	0%		-	1.8%	1.7%	0.9%	0%		-	1.4%	2.5%	1%	0%		-	-	-
Bicycles	2	0	0	0		-	0	1	0	0		-	0	1	0	0		-	1	2	0	0		-	-	-
Bicycle %	0.3%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0.1%	0.1%	0%	0%		-	-	-

Turning Movement Count
Location Name: KINGSTON RD & WHITES RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach WHITES RD						E Approach KINGSTON RD						S Approach WHITES RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	25	319	44	1	3	389	73	130	73	0	5	276	79	124	53	0	1	256	77	53	19	0	2	149	1070
08:15:00	18	259	33	1	4	311	69	150	83	0	1	302	91	102	40	1	0	234	90	58	14	1	0	163	1010
08:30:00	26	293	26	0	6	345	108	156	70	0	5	334	83	95	39	0	3	217	98	75	19	0	3	192	1088
08:45:00	38	262	36	1	6	337	76	163	65	0	7	304	120	127	45	0	3	292	94	94	23	1	4	212	1145
Grand Total	107	1133	139	3	19	1382	326	599	291	0	18	1216	373	448	177	1	7	999	359	280	75	2	9	716	**4313**
Approach%	7.7%	82%	10.1%	0.2%		-	26.8%	49.3%	23.9%	0%		-	37.3%	44.8%	17.7%	0.1%		-	50.1%	39.1%	10.5%	0.3%		-	-
Totals %	2.5%	26.3%	3.2%	0.1%		32%	7.6%	13.9%	6.7%	0%		28.2%	8.6%	10.4%	4.1%	0%		23.2%	8.3%	6.5%	1.7%	0%		16.6%	-
PHF	0.7	0.89	0.79	0.75		0.89	0.75	0.92	0.88	0		0.91	0.78	0.88	0.83	0.25		0.86	0.92	0.74	0.82	0.5		0.84	-
Heavy	3	19	4	0		26	11	21	4	0		36	19	18	2	0		39	8	15	2	0		25	-
Heavy %	2.8%	1.7%	2.9%	0%		1.9%	3.4%	3.5%	1.4%	0%		3%	5.1%	4%	1.1%	0%		3.9%	2.2%	5.4%	2.7%	0%		3.5%	-
Lights	104	1114	135	3		1356	315	578	287	0		1180	354	430	175	1		960	351	265	73	2		691	-
Lights %	97.2%	98.3%	97.1%	100%		98.1%	96.6%	96.5%	98.6%	0%		97%	94.9%	96%	98.9%	100%		96.1%	97.8%	94.6%	97.3%	100%		96.5%	-
Single-Unit Trucks	1	12	1	0		14	6	7	2	0		15	7	8	1	0		16	4	6	1	0		11	-
Single-Unit Trucks %	0.9%	1.1%	0.7%	0%		1%	1.8%	1.2%	0.7%	0%		1.2%	1.9%	1.8%	0.6%	0%		1.6%	1.1%	2.1%	1.3%	0%		1.5%	-
Buses	2	6	2	0		10	5	9	2	0		16	9	8	0	0		17	3	8	1	0		12	-
Buses %	1.9%	0.5%	1.4%	0%		0.7%	1.5%	1.5%	0.7%	0%		1.3%	2.4%	1.8%	0%	0%		1.7%	0.8%	2.9%	1.3%	0%		1.7%	-
Articulated Trucks	0	1	1	0		2	0	5	0	0		5	3	2	1	0		6	1	1	0	0		2	-
Articulated Trucks %	0%	0.1%	0.7%	0%		0.1%	0%	0.8%	0%	0%		0.4%	0.8%	0.4%	0.6%	0%		0.6%	0.3%	0.4%	0%	0%		0.3%	-
Pedestrians	-	-	-	-	18	-	-	-	-	-	18	-	-	-	-	-	7	-	-	-	-	-	8	-	-
Pedestrians%	-	-	-	-	34%		-	-	-	-	34%		-	-	-	-	13.2%		-	-	-	-	15.1%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	1.9%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	1.9%		-

Turning Movement Count
Location Name: KINGSTON RD & WHITES RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

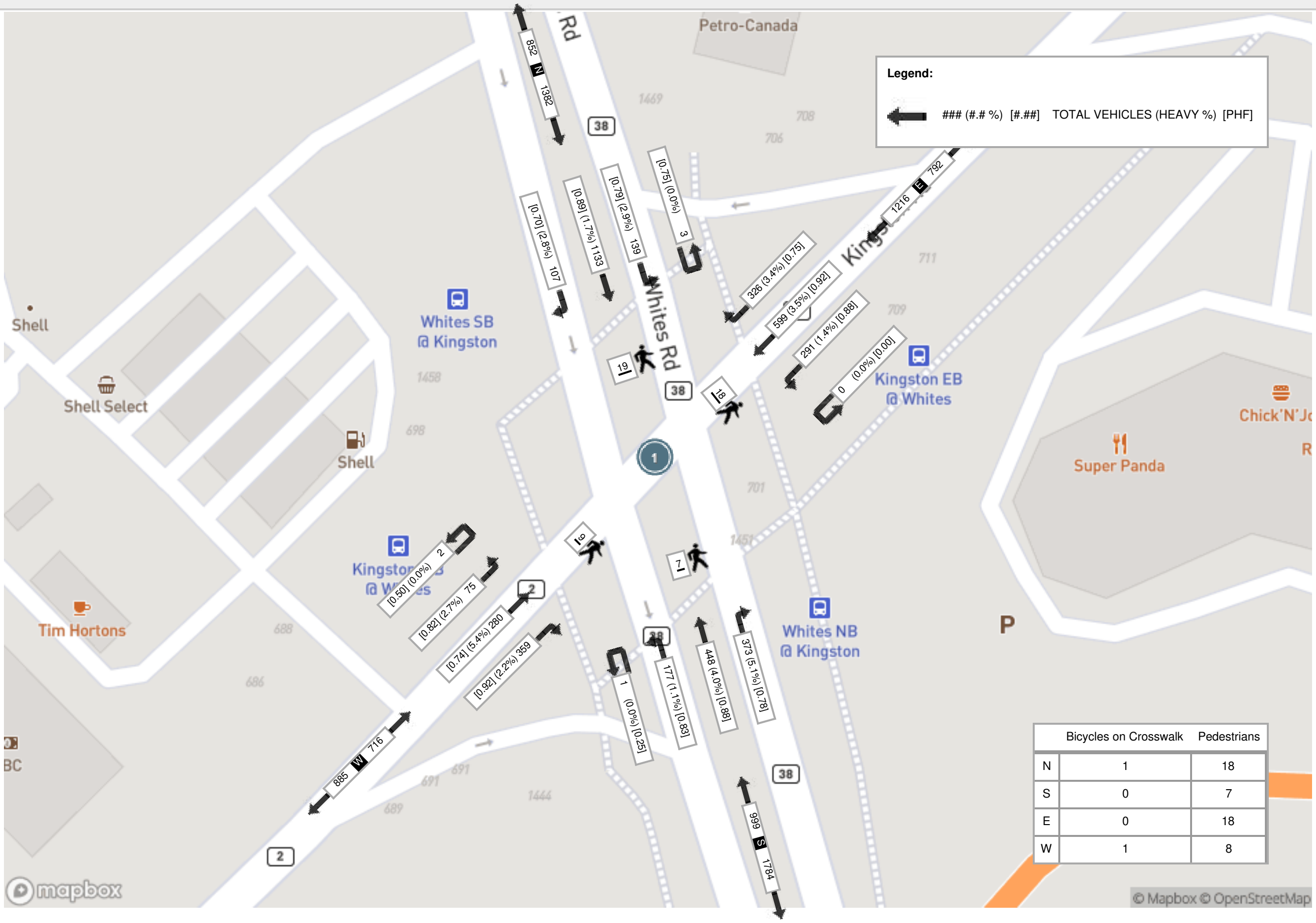
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach WHITES RD						E Approach KINGSTON RD						S Approach WHITES RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	44	155	42	0	3	241	135	177	61	0	4	373	209	279	68	0	14	556	103	202	39	1	16	345	1515
17:00:00	33	201	47	0	5	281	137	230	71	0	3	438	207	226	63	0	5	496	103	185	35	2	4	325	1540
17:15:00	42	177	42	0	10	261	142	191	69	0	7	402	204	290	67	0	1	561	81	178	42	1	2	302	1526
17:30:00	40	208	41	0	1	289	125	211	48	1	1	385	222	261	68	0	4	551	74	158	50	0	5	282	1507
Grand Total	159	741	172	0	19	1072	539	809	249	1	15	1598	842	1056	266	0	24	2164	361	723	166	4	27	1254	**6088**
Approach%	14.8%	69.1%	16%	0%		-	33.7%	50.6%	15.6%	0.1%		-	38.9%	48.8%	12.3%	0%		-	28.8%	57.7%	13.2%	0.3%		-	-
Totals %	2.6%	12.2%	2.8%	0%		17.6%	8.9%	13.3%	4.1%	0%		26.2%	13.8%	17.3%	4.4%	0%		35.5%	5.9%	11.9%	2.7%	0.1%		20.6%	-
PHF	0.9	0.89	0.91	0		0.93	0.95	0.88	0.88	0.25		0.91	0.95	0.91	0.98	0		0.96	0.88	0.89	0.83	0.5		0.91	-
Heavy	0	9	1	0		10	3	10	3	0		16	3	4	1	0		8	2	10	0	0		12	-
Heavy %	0%	1.2%	0.6%	0%		0.9%	0.6%	1.2%	1.2%	0%		1%	0.4%	0.4%	0.4%	0%		0.4%	0.6%	1.4%	0%	0%		1%	-
Lights	159	732	171	0		1062	536	799	246	1		1582	839	1052	265	0		2156	359	713	166	4		1242	-
Lights %	100%	98.8%	99.4%	0%		99.1%	99.4%	98.8%	98.8%	100%		99%	99.6%	99.6%	99.6%	0%		99.6%	99.4%	98.6%	100%	100%		99%	-
Single-Unit Trucks	0	4	0	0		4	1	2	2	0		5	1	2	1	0		4	2	3	0	0		5	-
Single-Unit Trucks %	0%	0.5%	0%	0%		0.4%	0.2%	0.2%	0.8%	0%		0.3%	0.1%	0.2%	0.4%	0%		0.2%	0.6%	0.4%	0%	0%		0.4%	-
Buses	0	4	1	0		5	1	8	0	0		9	2	2	0	0		4	0	7	0	0		7	-
Buses %	0%	0.5%	0.6%	0%		0.5%	0.2%	1%	0%	0%		0.6%	0.2%	0.2%	0%	0%		0.2%	0%	1%	0%	0%		0.6%	-
Articulated Trucks	0	1	0	0		1	1	0	1	0		2	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0.1%	0%	0%		0.1%	0.2%	0%	0.4%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	19	-	-	-	-	-	15	-	-	-	-	-	24	-	-	-	-	-	26	-	-
Pedestrians%	-	-	-	-	22.4%		-	-	-	-	17.6%		-	-	-	-	28.2%		-	-	-	-	30.6%		-
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	1	1	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	1.2%		-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

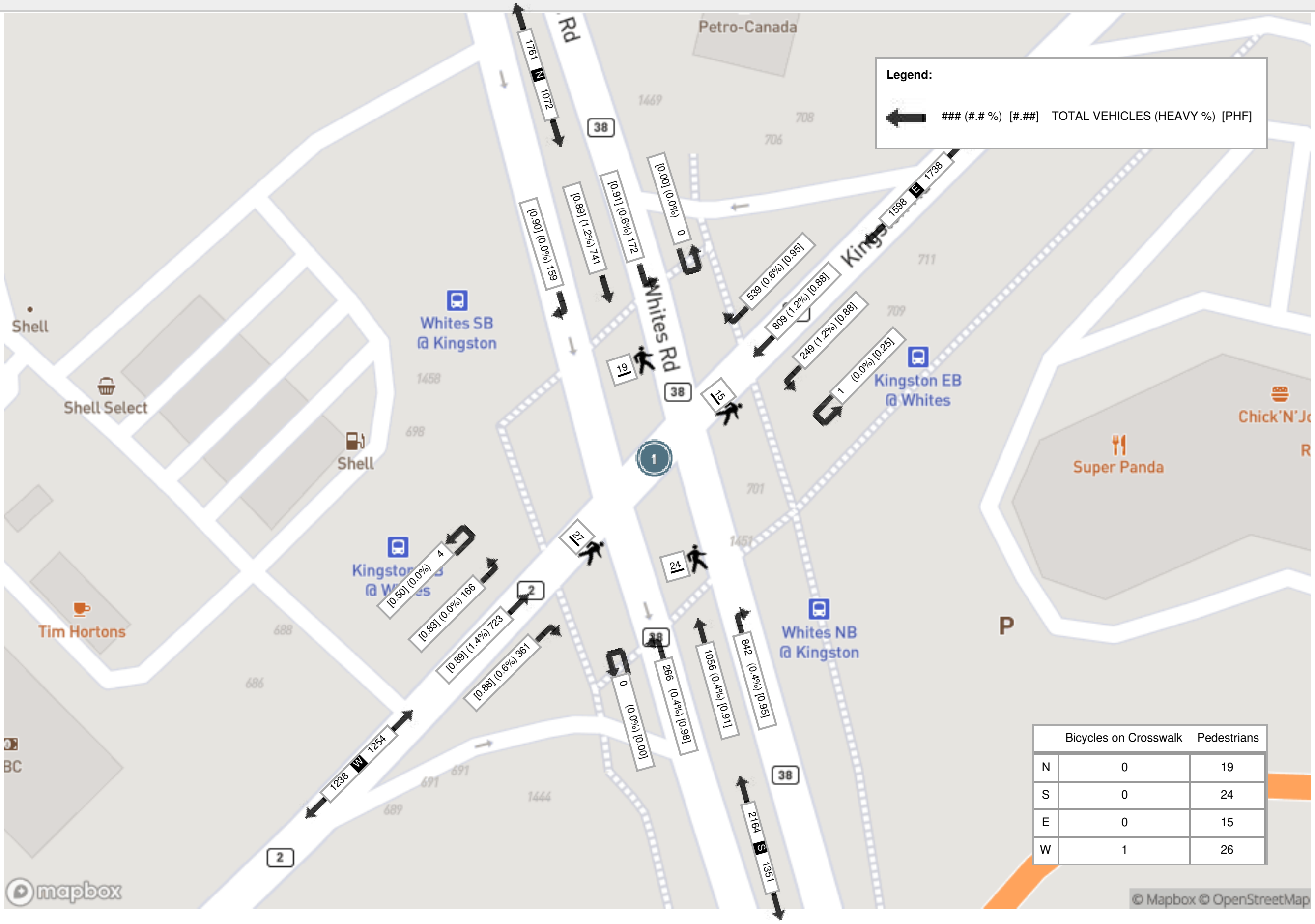
Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	18
S	0	7
E	0	18
W	1	8

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	19
S	0	24
E	0	15
W	1	26

Spectrum

Turning Movement Count
Location Name: KINGSTON RD & DELTA BLVD
Date: Tue, May 14, 2024   Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (2 . KINGSTON RD & DELTA BLVD)

Start Time	N Approach DELTA BLVD						E Approach KINGSTON RD						S Approach DELTA BLVD						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	40	2	8	0	0	50	20	144	1	0	7	165	1	0	6	0	7	7	3	61	20	0	0	84	306	
07:15:00	32	1	10	0	1	43	24	173	3	0	1	200	2	0	2	0	1	4	3	75	14	0	0	92	339	
07:30:00	35	0	8	0	1	43	21	180	3	0	4	204	2	1	4	0	3	7	6	105	22	0	0	133	387	
07:45:00	39	0	14	1	0	54	25	238	3	0	1	266	2	0	4	0	1	6	4	139	18	1	1	162	488	1520
08:00:00	37	1	6	0	1	44	36	218	2	0	2	256	4	0	3	0	2	7	5	146	25	0	0	176	483	1697
08:15:00	44	1	16	0	2	61	26	277	7	0	1	310	3	0	0	0	1	3	2	154	18	2	2	176	550	1908
08:30:00	35	3	11	0	0	49	28	282	1	0	0	311	3	1	6	0	0	10	3	158	15	0	2	176	546	2067
08:45:00	24	3	17	0	3	44	23	274	3	0	0	300	0	0	8	0	0	8	5	202	33	0	0	240	592	2171
09:00:00	34	1	16	0	1	51	27	255	3	0	4	285	4	0	13	0	0	17	2	169	23	2	2	196	549	2237
09:15:00	28	1	11	0	3	40	15	227	0	0	0	242	2	4	9	0	0	15	4	195	29	0	1	228	525	2212
09:30:00	35	2	19	0	1	56	23	212	6	0	0	241	2	1	5	0	0	8	1	174	32	1	0	208	513	2179
09:45:00	26	2	11	0	6	39	16	170	11	0	8	197	6	2	10	0	7	18	5	214	19	0	0	238	492	2079
BREAK																										
16:00:00	39	1	22	0	1	62	16	284	19	0	0	319	25	6	33	0	0	64	9	364	32	0	3	405	850	
16:15:00	33	2	19	0	2	54	23	325	18	0	1	366	29	2	26	0	2	57	5	380	26	1	2	412	889	
16:30:00	36	5	19	0	2	60	26	322	19	0	4	367	17	2	34	0	5	53	11	383	20	2	5	416	896	
16:45:00	26	2	23	0	6	51	28	330	22	0	1	380	38	6	45	0	1	89	14	349	31	2	3	396	916	3551
17:00:00	46	4	25	0	3	75	28	331	25	0	0	384	29	6	48	0	0	83	14	360	38	0	2	412	954	3655
17:15:00	30	3	37	0	1	70	28	344	18	0	1	390	31	4	40	0	0	75	6	350	28	2	1	386	921	3687
17:30:00	31	0	25	0	3	56	30	280	19	0	0	329	32	2	40	0	0	74	7	357	30	1	0	395	854	3645
17:45:00	46	2	18	0	3	66	27	282	26	0	1	335	29	1	29	0	1	59	5	321	31	1	1	358	818	3547
18:00:00	35	3	22	0	4	60	37	267	24	0	2	328	29	3	53	0	3	85	8	300	23	1	3	332	805	3398
18:15:00	23	1	17	0	12	41	33	284	13	0	0	330	27	4	32	1	0	64	8	290	37	2	1	337	772	3249
18:30:00	33	5	20	0	2	58	28	247	12	0	2	287	20	3	36	0	0	59	10	282	24	0	0	316	720	3115
18:45:00	39	1	12	0	1	52	20	306	11	0	2	337	25	3	33	0	0	61	7	290	29	0	1	326	776	3073
Grand Total	826	46	406	1	59	1279	608	6252	269	0	42	7129	362	51	519	1	34	933	147	5818	617	18	30	6600	**15941**	-
Approach%	64.6%	3.6%	31.7%	0.1%		-	8.5%	87.7%	3.8%	0%		-	38.8%	5.5%	55.6%	0.1%		-	2.2%	88.2%	9.3%	0.3%		-	-	-
Totals %	5.2%	0.3%	2.5%	0%		8%	3.8%	39.2%	1.7%	0%		44.7%	2.3%	0.3%	3.3%	0%		5.9%	0.9%	36.5%	3.9%	0.1%		41.4%	-	-
Heavy	4	0	2	0		-	1	135	4	0		-	3	2	6	0		-	4	124	2	0		-	-	-
Heavy %	0.5%	0%	0.5%	0%		-	0.2%	2.2%	1.5%	0%		-	0.8%	3.9%	1.2%	0%		-	2.7%	2.1%	0.3%	0%		-	-	-
Bicycles	0	0	0	0		-	0	1	0	0		-	0	0	0	0		-	0	2	0	0		-	-	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	-	-

Turning Movement Count
Location Name: KINGSTON RD & DELTA BLVD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach DELTA BLVD						E Approach KINGSTON RD						S Approach DELTA BLVD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	44	1	16	0	2	61	26	277	7	0	1	310	3	0	0	0	1	3	2	154	18	2	2	176	550
08:30:00	35	3	11	0	0	49	28	282	1	0	0	311	3	1	6	0	0	10	3	158	15	0	2	176	546
08:45:00	24	3	17	0	3	44	23	274	3	0	0	300	0	0	8	0	0	8	5	202	33	0	0	240	592
09:00:00	34	1	16	0	1	51	27	255	3	0	4	285	4	0	13	0	0	17	2	169	23	2	2	196	549
Grand Total	137	8	60	0	6	205	104	1088	14	0	5	1206	10	1	27	0	1	38	12	683	89	4	6	788	**2237**
Approach%	66.8%	3.9%	29.3%	0%		-	8.6%	90.2%	1.2%	0%		-	26.3%	2.6%	71.1%	0%		-	1.5%	86.7%	11.3%	0.5%		-	-
Totals %	6.1%	0.4%	2.7%	0%		9.2%	4.6%	48.6%	0.6%	0%		53.9%	0.4%	0%	1.2%	0%		1.7%	0.5%	30.5%	4%	0.2%		35.2%	-
PHF	0.78	0.67	0.88	0		0.84	0.93	0.96	0.5	0		0.97	0.63	0.25	0.52	0		0.56	0.6	0.85	0.67	0.5		0.82	-
Heavy	0	0	0	0		0	0	34	2	0		36	1	0	2	0		3	0	32	0	0		32	-
Heavy %	0%	0%	0%	0%		0%	0%	3.1%	14.3%	0%		3%	10%	0%	7.4%	0%		7.9%	0%	4.7%	0%	0%		4.1%	-
Lights	137	8	60	0		205	104	1054	12	0		1170	9	1	25	0		35	12	651	89	4		756	-
Lights %	100%	100%	100%	0%		100%	100%	96.9%	85.7%	0%		97%	90%	100%	92.6%	0%		92.1%	100%	95.3%	100%	100%		95.9%	-
Single-Unit Trucks	0	0	0	0		0	0	14	0	0		14	1	0	1	0		2	0	10	0	0		10	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.2%	10%	0%	3.7%	0%		5.3%	0%	1.5%	0%	0%		1.3%	-
Buses	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	0	18	0	0		18	-
Buses %	0%	0%	0%	0%		0%	0%	1.4%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	2.6%	0%	0%		2.3%	-
Articulated Trucks	0	0	0	0		0	0	5	2	0		7	0	0	1	0		1	0	4	0	0		4	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.5%	14.3%	0%		0.6%	0%	0%	3.7%	0%		2.6%	0%	0.6%	0%	0%		0.5%	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	5	-	-	-	-	-	1	-	-	-	-	-	6	-	-
Pedestrians%	-	-	-	-	33.3%		-	-	-	-	27.8%		-	-	-	-	5.6%		-	-	-	-	33.3%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Turning Movement Count
Location Name: KINGSTON RD & DELTA BLVD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach DELTA BLVD						E Approach KINGSTON RD						S Approach DELTA BLVD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	36	5	19	0	2	60	26	322	19	0	4	367	17	2	34	0	5	53	11	383	20	2	5	416	896
16:45:00	26	2	23	0	6	51	28	330	22	0	1	380	38	6	45	0	1	89	14	349	31	2	3	396	916
17:00:00	46	4	25	0	3	75	28	331	25	0	0	384	29	6	48	0	0	83	14	360	38	0	2	412	954
17:15:00	30	3	37	0	1	70	28	344	18	0	1	390	31	4	40	0	0	75	6	350	28	2	1	386	921
Grand Total	138	14	104	0	12	256	110	1327	84	0	6	1521	115	18	167	0	6	300	45	1442	117	6	11	1610	**3687**
Approach%	53.9%	5.5%	40.6%	0%		-	7.2%	87.2%	5.5%	0%		-	38.3%	6%	55.7%	0%		-	2.8%	89.6%	7.3%	0.4%		-	-
Totals %	3.7%	0.4%	2.8%	0%		6.9%	3%	36%	2.3%	0%		41.3%	3.1%	0.5%	4.5%	0%		8.1%	1.2%	39.1%	3.2%	0.2%		43.7%	-
PHF	0.75	0.7	0.7	0		0.85	0.98	0.96	0.84	0		0.98	0.76	0.75	0.87	0		0.84	0.8	0.94	0.77	0.75		0.97	-
Heavy	1	0	0	0		1	0	15	0	0		15	0	1	1	0		2	1	16	0	0		17	-
Heavy %	0.7%	0%	0%	0%		0.4%	0%	1.1%	0%	0%		1%	0%	5.6%	0.6%	0%		0.7%	2.2%	1.1%	0%	0%		1.1%	-
Lights	137	14	104	0		255	110	1312	84	0		1506	115	17	166	0		298	44	1426	117	6		1593	-
Lights %	99.3%	100%	100%	0%		99.6%	100%	98.9%	100%	0%		99%	100%	94.4%	99.4%	0%		99.3%	97.8%	98.9%	100%	100%		98.9%	-
Single-Unit Trucks	1	0	0	0		1	0	4	0	0		4	0	1	0	0		1	1	4	0	0		5	-
Single-Unit Trucks %	0.7%	0%	0%	0%		0.4%	0%	0.3%	0%	0%		0.3%	0%	5.6%	0%	0%		0.3%	2.2%	0.3%	0%	0%		0.3%	-
Buses	0	0	0	0		0	0	10	0	0		10	0	0	0	0		0	0	11	0	0		11	-
Buses %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.7%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	1	0		1	0	1	0	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0.6%	0%		0.3%	0%	0.1%	0%	0%		0.1%	-
Pedestrians	-	-	-	-	12	-	-	-	-	-	6	-	-	-	-	-	6	-	-	-	-	-	11	-	-
Pedestrians%	-	-	-	-	34.3%		-	-	-	-	17.1%		-	-	-	-	17.1%		-	-	-	-	31.4%		-
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Turning Movement Count
Location Name: KINGSTON RD & DELTA BLVD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

	Bicycles on Crosswalk	Pedestrians
N	0	6
S	0	1
E	0	5
W	0	6

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

	Bicycles on Crosswalk	Pedestrians
N	0	12
S	0	6
E	0	6
W	0	11

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (9 . 705-715 KINGSTON RD & INTERNAL ACCESS)

Start Time	N Approach DELTA BLVD							E Approach EAST DRIVEWAY						
	Right N:W	Thru N:S	Bear Left N:SE	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	Hard Left E:SE	UTurn E:E	Peds E:	Approach Total
07:00:00	5	1	0	0	0	1	6	1	0	0	0	0	0	1
07:15:00	2	0	0	5	0	0	7	1	0	0	0	0	0	1
07:30:00	4	0	0	5	0	2	9	3	0	1	0	0	0	4
07:45:00	2	0	0	5	0	0	7	2	0	0	0	0	0	2
08:00:00	2	0	0	6	0	1	8	2	1	0	0	0	0	3
08:15:00	4	1	0	3	0	0	8	0	0	0	0	0	0	0
08:30:00	5	1	0	2	0	0	8	3	0	0	0	0	0	3
08:45:00	8	0	0	4	0	0	12	2	0	0	0	0	2	2
09:00:00	2	1	0	1	1	1	5	1	0	0	0	0	0	1
09:15:00	3	0	0	2	0	0	5	6	0	0	0	0	1	6
09:30:00	7	1	0	2	0	0	10	2	1	0	0	0	0	3
09:45:00	11	1	0	5	0	1	17	2	1	0	0	0	0	3
BREAK														
16:00:00	15	6	0	8	0	0	29	8	1	0	0	0	11	9
16:15:00	21	3	0	2	0	0	26	4	1	0	0	0	8	5
16:30:00	25	3	0	7	0	0	35	6	1	0	0	0	4	7
16:45:00	27	9	0	1	1	0	38	5	0	0	0	0	6	5
17:00:00	31	5	0	6	0	0	42	10	0	0	0	0	0	10
17:15:00	22	6	0	0	1	1	29	7	0	0	0	0	0	7
17:30:00	14	7	0	1	1	0	23	7	0	0	0	0	1	7
17:45:00	26	6	0	1	0	0	33	2	2	0	0	0	0	4
18:00:00	29	5	0	3	1	0	38	2	1	0	0	0	0	3
18:15:00	17	3	0	4	0	0	24	0	0	0	0	0	0	0
18:30:00	19	4	0	2	1	0	26	1	0	0	0	0	0	1
18:45:00	12	4	0	1	1	2	18	5	1	0	0	0	0	6
Grand Total	313	67	0	76	7	9	463	82	10	1	0	0	33	93
Approach%	67.6%	14.5%	0%	16.4%	1.5%		-	88.2%	10.8%	1.1%	0%	0%		-
Totals %	22.2%	4.8%	0%	5.4%	0.5%		32.8%	5.8%	0.7%	0.1%	0%	0%		6.6%
Heavy	5	3	0	0	0		-	1	0	0	0	0		-
Heavy %	1.6%	4.5%	0%	0%	0%		-	1.2%	0%	0%	0%	0%		-
Bicycles	0	0	0	1	0		-	0	0	0	0	0		-
Bicycle %	0%	0%	0%	1.3%	0%		-	0%	0%	0%	0%	0%		-

Start Time	S Approach SOUTH ACCESS							W Approach WEST DRIVEWAY							SE Approach SOUTHEAST ACCESS							Int. Total (15 min)	Int. Total (1 hr)
	Hard Right S:SE	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Bear Right W:SE	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total	Hard Right SE:E	Bear Right SE:N	Bear Left SE:W	Hard Left SE:S	UTurn SE:SE	Peds SE:	Approach Total		
07:00:00	0	0	2	0	0	0	2	0	0	0	3	0	0	3	0	0	0	0	0	0	0	12	
07:15:00	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	12	
07:30:00	0	0	1	0	0	0	1	0	0	0	2	0	2	2	0	0	0	0	0	0	0	16	
07:45:00	0	0	2	0	0	0	2	0	0	0	2	0	0	2	0	0	0	0	0	0	0	13	53
08:00:00	0	1	1	0	0	0	2	0	0	0	4	0	1	4	0	0	0	0	0	0	0	17	58
08:15:00	0	0	0	0	0	0	0	0	0	0	3	0	1	3	0	0	0	0	0	0	0	11	57
08:30:00	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	18	59
08:45:00	0	0	3	0	0	0	3	0	0	0	5	0	0	5	0	0	0	0	0	0	0	22	68
09:00:00	0	0	6	0	0	0	6	0	0	0	9	0	1	9	0	0	0	0	0	0	0	21	72
09:15:00	0	0	5	0	0	0	5	0	0	0	4	0	0	4	0	0	0	0	0	0	0	20	81
09:30:00	0	0	2	0	0	0	2	0	0	0	4	0	0	4	0	0	0	0	0	0	0	19	82
09:45:00	0	0	8	0	0	0	8	0	0	1	11	0	1	12	0	0	0	0	0	0	0	40	100
BREAK																							
16:00:00	0	0	28	0	0	1	28	0	0	1	28	0	0	29	0	0	0	0	0	0	0	95	
16:15:00	0	0	31	0	0	0	31	0	0	1	20	0	0	21	0	0	0	0	0	0	0	83	
16:30:00	0	0	28	0	0	0	28	0	0	0	24	0	0	24	0	0	0	0	0	0	0	94	
16:45:00	0	1	44	0	0	1	45	0	0	0	38	0	0	38	0	0	0	0	0	0	0	126	398
17:00:00	0	0	41	0	0	0	41	0	0	0	30	0	0	30	0	0	0	0	0	0	0	123	426
17:15:00	0	0	39	0	0	0	39	0	0	0	28	0	0	28	0	0	0	0	0	0	0	103	446
17:30:00	0	0	35	0	0	0	35	0	0	0	29	0	0	29	0	0	0	0	0	0	0	94	446
17:45:00	0	0	36	0	0	1	36	0	0	0	27	0	1	27	0	0	0	0	0	0	0	100	420
18:00:00	0	0	42	0	0	0	42	0	0	0	33	0	0	33	0	0	0	0	0	0	0	116	413
18:15:00	0	0	27	0	0	0	27	0	0	0	41	0	0	41	0	0	0	0	0	0	0	92	402
18:30:00	0	0	32	0	0	0	32	0	0	0	23	0	0	23	0	0	0	0	0	0	0	82	390
18:45:00	0	0	29	0	0	0	29	0	0	0	28	0	0	28	0	0	0	0	0	0	0	81	371
Grand Total	0	2	442	0	0	3	444	0	0	3	407	0	7	410	0	0	0	0	0	0	0	**1410**	-
Approach%	0%	0.5%	99.5%	0%	0%		-	0%	0%	0.7%	99.3%	0%		-	0%	0%	0%	0%	0%		-	-	-
Totals %	0%	0.1%	31.3%	0%	0%		31.5%	0%	0%	0.2%	28.9%	0%		29.1%	0%	0%	0%	0%	0%		0%	-	-
Heavy	0	0	5	0	0		-	0	0	0	5	0		-	0	0	0	0	0		-	-	-
Heavy %	0%	0%	1.1%	0%	0%		-	0%	0%	0%	1.2%	0%		-	0%	0%	0%	0%	0%		-	-	-
Bicycles	0	0	0	0	0		-	0	0	0	0	0		-	0	0	0	0	0		-	-	-
Bicycle %	0%	0%	0%	0%	0%		-	0%	0%	0%	0%	0%		-	0%	0%	0%	0%	0%		-	-	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach DELTA BLVD							E Approach EAST DRIVEWAY							S Approach SOUTH ACCESS							W Approach WEST DRIVEWAY							SE Approach SOUTHEAST ACCESS							Int. Total (15 min)
	Right	Thru	Bear Left	Left	UTurn	Peds	Approach Total	Right	Thru	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Bear Right	Thru	Left	UTurn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	UTurn	Peds	Approach Total	
09:00:00	2	1	0	1	1	1	5	1	0	0	0	0	0	1	0	0	6	0	0	0	6	0	0	0	9	0	1	9	0	0	0	0	0	0	0	21
09:15:00	3	0	0	2	0	0	5	6	0	0	0	0	1	6	0	0	5	0	0	0	5	0	0	0	4	0	0	4	0	0	0	0	0	0	0	20
09:30:00	7	1	0	2	0	0	10	2	1	0	0	0	0	3	0	0	2	0	0	0	2	0	0	0	4	0	0	4	0	0	0	0	0	0	0	19
09:45:00	11	1	0	5	0	1	17	2	1	0	0	0	0	3	0	0	8	0	0	0	8	0	0	1	11	0	1	12	0	0	0	0	0	0	0	40
Grand Total	23	3	0	10	1	2	37	11	2	0	0	0	1	13	0	0	21	0	0	0	21	0	0	1	28	0	2	29	0	0	0	0	0	0	0	**100**
Approach%	62.2%	8.1%	0%	27%	2.7%		-	84.6%	15.4%	0%	0%	0%		-	0%	0%	100%	0%	0%		-	0%	0%	3.4%	96.6%	0%		-	0%	0%	0%	0%	0%		-	-
Totals %	23%	3%	0%	10%	1%		37%	11%	2%	0%	0%	0%		13%	0%	0%	21%	0%	0%		21%	0%	0%	1%	28%	0%		29%	0%	0%	0%	0%	0%		0%	-
PHF	0.52	0.75	0	0.5	0.25		0.54	0.46	0.5	0	0	0		0.54	0	0	0.66	0	0		0.66	0	0	0.25	0.64	0		0.6	0	0	0	0	0		0	-
Heavy	1	0	0	0	0		1	0	0	0	0	0		0	0	0	2	0	0		2	0	0	0	0	0		0	0	0	0	0	0		0	-
Heavy %	4.3%	0%	0%	0%	0%		2.7%	0%	0%	0%	0%	0%		0%	0%	0%	9.5%	0%	0%		9.5%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Lights	22	3	0	10	1		36	11	2	0	0	0		13	0	0	19	0	0		19	0	0	1	28	0		29	0	0	0	0	0		0	-
Lights %	95.7%	100%	0%	100%	100%		97.3%	100%	100%	0%	0%	0%		100%	0%	0%	90.5%	0%	0%		90.5%	0%	0%	100%	100%	0%		100%	0%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	1	0	0	0	0		1	0	0	0	0	0		0	0	0	2	0	0		2	0	0	0	0	0		0	0	0	0	0	0		0	-
Single-Unit Trucks %	4.3%	0%	0%	0%	0%		2.7%	0%	0%	0%	0%	0%		0%	0%	0%	9.5%	0%	0%		9.5%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	2	-	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	-	40%		-	-	-	-	-	20%		-	-	-	-	-	0%		-	-	-	-	-	40%		-	-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-

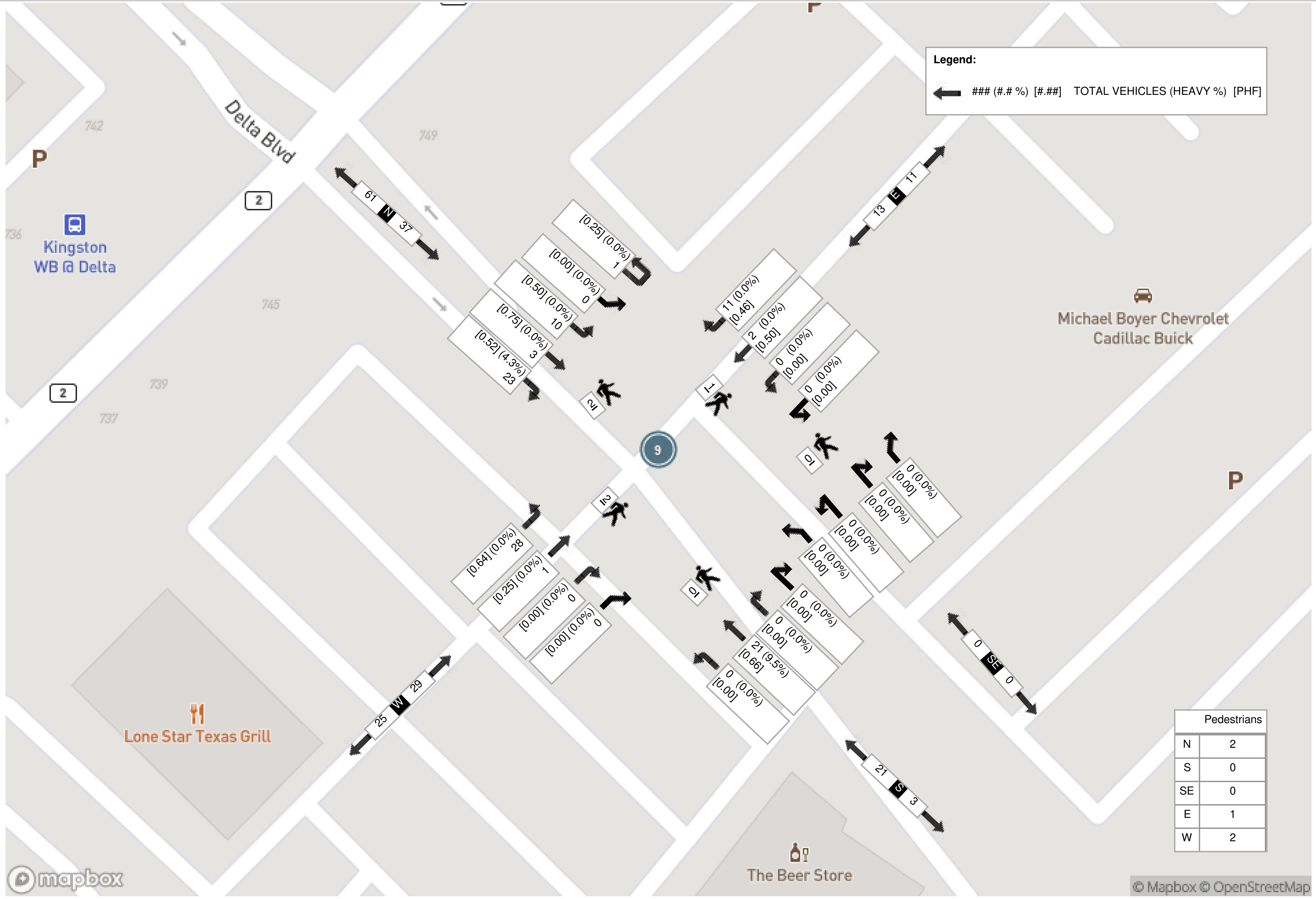
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach DELTA BLVD							E Approach EAST DRIVEWAY							S Approach SOUTH ACCESS							W Approach WEST DRIVEWAY							SE Approach SOUTHEAST ACCESS							Int. Total (15 min)
	Right	Thru	Bear Left	Left	UTurn	Peds	Approach Total	Right	Thru	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Bear Right	Thru	Left	UTurn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	UTurn	Peds	Approach Total	
16:45:00	27	9	0	1	1	0	38	5	0	0	0	0	6	5	0	1	44	0	0	1	45	0	0	0	38	0	0	38	0	0	0	0	0	0	0	126
17:00:00	31	5	0	6	0	0	42	10	0	0	0	0	0	10	0	0	41	0	0	0	41	0	0	0	30	0	0	30	0	0	0	0	0	0	0	123
17:15:00	22	6	0	0	1	1	29	7	0	0	0	0	0	7	0	0	39	0	0	0	39	0	0	0	28	0	0	28	0	0	0	0	0	0	0	103
17:30:00	14	7	0	1	1	0	23	7	0	0	0	0	1	7	0	0	35	0	0	0	35	0	0	0	29	0	0	29	0	0	0	0	0	0	0	94
Grand Total	94	27	0	8	3	1	132	29	0	0	0	0	7	29	0	1	159	0	0	1	160	0	0	0	125	0	0	125	0	0	0	0	0	0	0	**446**
Approach%	71.2%	20.5%	0%	6.1%	2.3%		-	100%	0%	0%	0%	0%		-	0%	0.6%	99.4%	0%	0%		-	0%	0%	0%	100%	0%		-	0%	0%	0%	0%	0%		-	-
Totals %	21.1%	6.1%	0%	1.8%	0.7%		29.6%	6.5%	0%	0%	0%	0%		6.5%	0%	0.2%	35.7%	0%	0%		35.9%	0%	0%	0%	28%	0%		28%	0%	0%	0%	0%	0%		0%	-
PHF	0.76	0.75	0	0.33	0.75		0.79	0.73	0	0	0	0		0.73	0	0.25	0.9	0	0		0.89	0	0	0	0.82	0		0.82	0	0	0	0	0		0	-
Heavy	0	1	0	0	0		1	1	0	0	0	0		1	0	0	1	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	-
Heavy %	0%	3.7%	0%	0%	0%		0.8%	3.4%	0%	0%	0%	0%		3.4%	0%	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Lights	94	26	0	8	3		131	28	0	0	0	0		28	0	1	158	0	0		159	0	0	0	125	0		125	0	0	0	0	0		0	-
Lights %	100%	96.3%	0%	100%	100%		99.2%	96.6%	0%	0%	0%	0%		96.6%	0%	100%	99.4%	0%	0%		99.4%	0%	0%	0%	100%	0%		100%	0%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	1	0	0	0		1	0	0	0	0	0		0	0	0	1	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	-
Single-Unit Trucks %	0%	3.7%	0%	0%	0%		0.8%	0%	0%	0%	0%	0%		0%	0%	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0	0		0	1	0	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%	0%		0%	3.4%	0%	0%	0%	0%		3.4%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	-	7	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	-	11.1%		-	-	-	-	-	77.8%		-	-	-	-	-	11.1%		-	-	-	-	-	0%		-	-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 09:00 AM - 10:00 AM Weather: Overcast Clouds (14.7 °C)



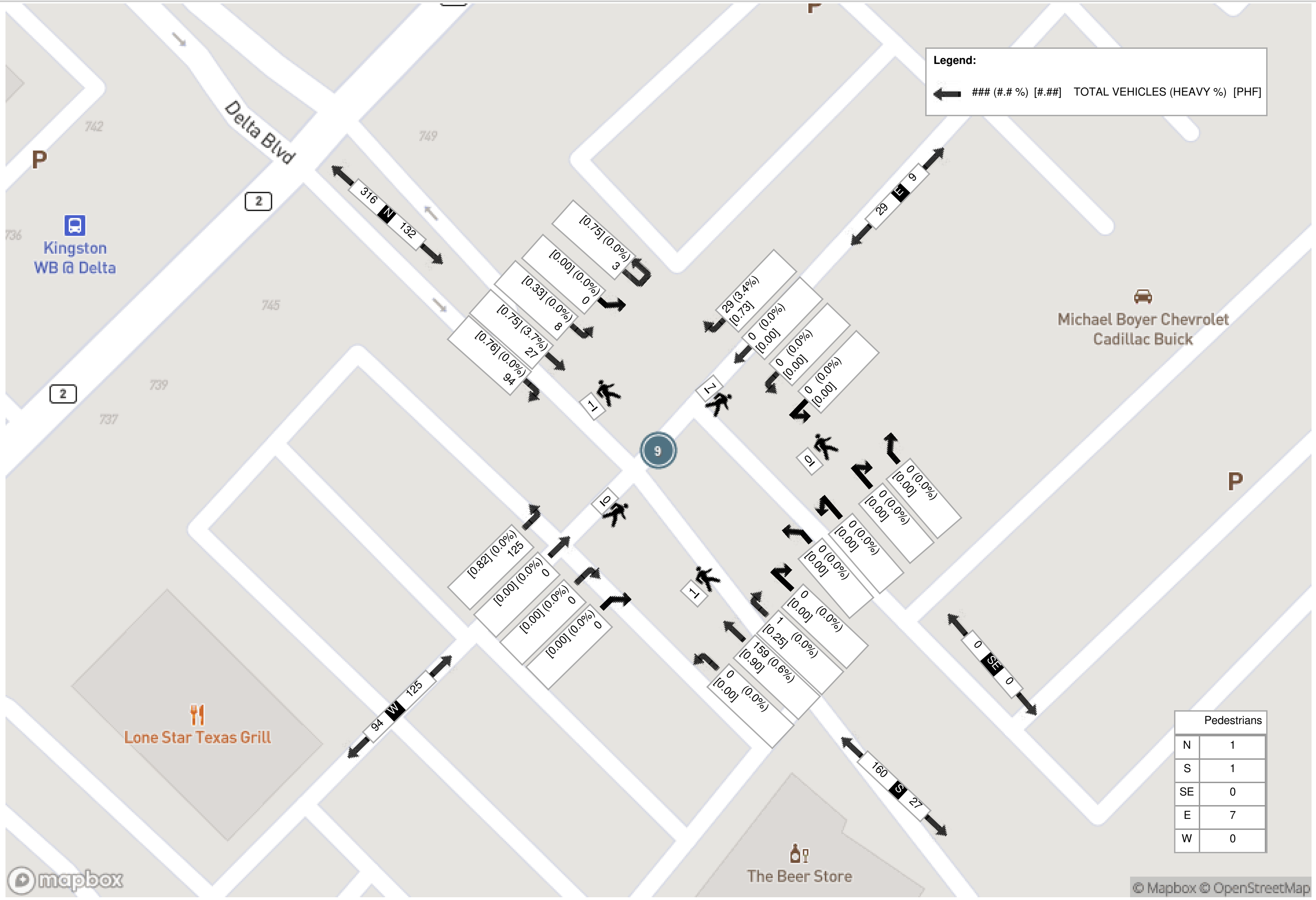
	Pedestrians
N	2
S	0
SE	0
E	1
W	2

Spectrum

Turning Movement Count
Location Name: 705-715 KINGSTON RD & INTERNAL ACCESS
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)



Turning Movement Count
Location Name: KINGSTON RD & 780 KINGSTON RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (3 . KINGSTON RD & 780 KINGSTON RD)

Start Time	N Approach 780 KINGSTON RD						E Approach KINGSTON RD						S Approach 775 KINGSTON RD						W Approach KINGSTON RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	2	0	1	0	1	3	2	157	2	0	0	161	0	0	0	0	0	0	2	65	1	0	0	68	232	
07:15:00	6	0	3	0	0	9	5	202	4	0	0	211	0	0	0	0	0	0	1	83	8	0	0	92	312	
07:30:00	4	0	1	0	1	5	2	186	8	0	0	196	1	0	0	0	1	1	2	107	4	0	0	113	315	
07:45:00	7	0	5	0	0	12	5	272	8	0	0	285	3	0	0	0	0	3	3	138	11	0	0	152	452	1311
08:00:00	8	0	5	0	2	13	11	245	5	0	0	261	1	0	0	0	1	1	2	149	9	0	0	160	435	1514
08:15:00	14	0	6	0	2	20	9	301	1	0	0	311	3	0	0	0	0	3	1	165	6	0	0	172	506	1708
08:30:00	10	0	3	0	1	13	9	298	3	0	0	310	1	0	1	0	0	2	2	160	13	0	0	175	500	1893
08:45:00	3	0	4	0	1	7	4	309	10	0	0	323	4	0	0	0	0	4	0	211	10	0	0	221	555	1996
09:00:00	13	0	3	0	0	16	6	273	5	0	0	284	2	0	1	0	0	3	2	187	6	0	0	195	498	2059
09:15:00	6	0	4	0	2	10	5	234	5	0	0	244	0	0	0	0	0	0	1	206	3	0	0	210	464	2017
09:30:00	5	0	0	0	2	5	5	236	5	0	0	246	3	0	0	0	0	3	2	205	3	1	0	211	465	1982
09:45:00	3	0	1	0	2	4	3	191	5	0	0	199	1	0	0	0	0	1	1	226	10	0	0	237	441	1868
BREAK																										
16:00:00	13	0	2	0	1	15	7	316	2	0	0	325	3	0	0	0	0	3	3	400	11	0	0	414	757	
16:15:00	16	0	3	0	2	19	10	333	3	0	0	346	3	0	2	0	0	5	5	396	22	0	0	423	793	
16:30:00	18	0	5	0	0	23	13	362	4	0	0	379	6	0	2	0	2	8	0	404	13	0	0	417	827	
16:45:00	19	0	7	0	1	26	13	347	2	0	0	362	4	0	2	0	0	6	2	386	13	0	0	401	795	3172
17:00:00	17	0	7	0	4	24	12	381	2	0	0	395	9	0	2	0	1	11	3	410	11	0	0	424	854	3269
17:15:00	17	1	2	0	2	20	6	357	1	0	0	364	3	0	2	0	0	5	1	402	15	0	0	418	807	3283
17:30:00	18	0	7	0	4	25	10	327	2	1	0	340	3	0	1	0	0	4	1	404	10	0	0	415	784	3240
17:45:00	18	0	3	0	3	21	8	303	2	0	0	313	3	0	0	0	0	3	0	347	8	0	0	355	692	3137
18:00:00	16	0	4	0	5	20	8	325	1	0	0	334	2	0	1	0	1	3	1	352	9	0	0	362	719	3002
18:15:00	7	0	5	0	3	12	8	303	5	0	0	316	8	0	0	0	0	8	1	329	5	0	0	335	671	2866
18:30:00	9	0	10	0	0	19	7	289	1	1	0	298	4	1	1	0	3	6	4	314	8	0	0	326	649	2731
18:45:00	9	0	5	0	5	14	6	318	2	0	0	326	6	0	2	0	0	8	1	317	6	0	0	324	672	2711
Grand Total	258	1	96	0	44	355	174	6865	88	2	0	7129	73	1	17	0	9	91	41	6363	215	1	0	6620	**14195**	-
Approach%	72.7%	0.3%	27%	0%		-	2.4%	96.3%	1.2%	0%		-	80.2%	1.1%	18.7%	0%		-	0.6%	96.1%	3.2%	0%		-	-	-
Totals %	1.8%	0%	0.7%	0%		2.5%	1.2%	48.4%	0.6%	0%		50.2%	0.5%	0%	0.1%	0%		0.6%	0.3%	44.8%	1.5%	0%		46.6%	-	-
Heavy	2	0	1	0		-	3	139	0	0		-	0	0	0	0		-	1	130	5	0		-	-	-
Heavy %	0.8%	0%	1%	0%		-	1.7%	2%	0%	0%		-	0%	0%	0%	0%		-	2.4%	2%	2.3%	0%		-	-	-
Bicycles	0	0	0	0		-	0	1	0	0		-	0	0	0	0		-	0	2	0	0		-	-	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	-	-

Turning Movement Count
Location Name: KINGSTON RD & 780 KINGSTON RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach 780 KINGSTON RD						E Approach KINGSTON RD						S Approach 775 KINGSTON RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	14	0	6	0	2	20	9	301	1	0	0	311	3	0	0	0	0	3	1	165	6	0	0	172	506
08:30:00	10	0	3	0	1	13	9	298	3	0	0	310	1	0	1	0	0	2	2	160	13	0	0	175	500
08:45:00	3	0	4	0	1	7	4	309	10	0	0	323	4	0	0	0	0	4	0	211	10	0	0	221	555
09:00:00	13	0	3	0	0	16	6	273	5	0	0	284	2	0	1	0	0	3	2	187	6	0	0	195	498
Grand Total	40	0	16	0	4	56	28	1181	19	0	0	1228	10	0	2	0	0	12	5	723	35	0	0	763	**2059**
Approach%	71.4%	0%	28.6%	0%		-	2.3%	96.2%	1.5%	0%		-	83.3%	0%	16.7%	0%		-	0.7%	94.8%	4.6%	0%		-	-
Totals %	1.9%	0%	0.8%	0%		2.7%	1.4%	57.4%	0.9%	0%		59.6%	0.5%	0%	0.1%	0%		0.6%	0.2%	35.1%	1.7%	0%		37.1%	-
PHF	0.71	0	0.67	0		0.7	0.78	0.96	0.48	0		0.95	0.63	0	0.5	0		0.75	0.63	0.86	0.67	0		0.86	-
Heavy	1	0	0	0		1	1	35	0	0		36	0	0	0	0		0	0	31	2	0		33	-
Heavy %	2.5%	0%	0%	0%		1.8%	3.6%	3%	0%	0%		2.9%	0%	0%	0%	0%		0%	0%	4.3%	5.7%	0%		4.3%	-
Lights	39	0	16	0		55	27	1146	19	0		1192	10	0	2	0		12	5	692	33	0		730	-
Lights %	97.5%	0%	100%	0%		98.2%	96.4%	97%	100%	0%		97.1%	100%	0%	100%	0%		100%	100%	95.7%	94.3%	0%		95.7%	-
Single-Unit Trucks	1	0	0	0		1	1	13	0	0		14	0	0	0	0		0	0	9	2	0		11	-
Single-Unit Trucks %	2.5%	0%	0%	0%		1.8%	3.6%	1.1%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	1.2%	5.7%	0%		1.4%	-
Buses	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	0	18	0	0		18	-
Buses %	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	2.5%	0%	0%		2.4%	-
Articulated Trucks	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	4	0	0		4	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.5%	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	100%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach 780 KINGSTON RD						E Approach KINGSTON RD						S Approach 775 KINGSTON RD						W Approach KINGSTON RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	18	0	5	0	0	23	13	362	4	0	0	379	6	0	2	0	2	8	0	404	13	0	0	417	827
16:45:00	19	0	7	0	1	26	13	347	2	0	0	362	4	0	2	0	0	6	2	386	13	0	0	401	795
17:00:00	17	0	7	0	4	24	12	381	2	0	0	395	9	0	2	0	1	11	3	410	11	0	0	424	854
17:15:00	17	1	2	0	2	20	6	357	1	0	0	364	3	0	2	0	0	5	1	402	15	0	0	418	807
Grand Total	71	1	21	0	7	93	44	1447	9	0	0	1500	22	0	8	0	3	30	6	1602	52	0	0	1660	**3283**
Approach%	76.3%	1.1%	22.6%	0%		-	2.9%	96.5%	0.6%	0%		-	73.3%	0%	26.7%	0%		-	0.4%	96.5%	3.1%	0%		-	-
Totals %	2.2%	0%	0.6%	0%		2.8%	1.3%	44.1%	0.3%	0%		45.7%	0.7%	0%	0.2%	0%		0.9%	0.2%	48.8%	1.6%	0%		50.6%	-
PHF	0.93	0.25	0.75	0		0.89	0.85	0.95	0.56	0		0.95	0.61	0	1	0		0.68	0.5	0.98	0.87	0		0.98	-
Heavy	0	0	0	0		0	0	15	0	0		15	0	0	0	0		0	1	16	0	0		17	-
Heavy %	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	0%	0%	0%	0%		0%	16.7%	1%	0%	0%		1%	-
Lights	71	1	21	0		93	44	1432	9	0		1485	22	0	8	0		30	5	1586	52	0		1643	-
Lights %	100%	100%	100%	0%		100%	100%	99%	100%	0%		99%	100%	0%	100%	0%		100%	83.3%	99%	100%	0%		99%	-
Single-Unit Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	5	0	0		5	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	-
Buses	0	0	0	0		0	0	9	0	0		9	0	0	0	0		0	0	11	0	0		11	-
Buses %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	1	0	0	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	16.7%	0%	0%	0%		0.1%	-
Pedestrians	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	70%		-	-	-	-	0%		-	-	-	-	20%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	10%		-	-	-	-	0%		-

Turning Movement Count
Location Name: KINGSTON RD & 780 KINGSTON RD
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

	Bicycles on Crosswalk	Pedestrians
N	0	4
S	0	0
E	0	0
W	0	0

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

	Bicycles on Crosswalk	Pedestrians
N	0	7
S	1	2
E	0	0
W	0	0

Turning Movement Count (4 . KINGSTON RD & HWY 401 WB RAMPS)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
07:00:00	98	56	0	0	154	7	68	0	0	75	2	59	0	0	61	290	
07:15:00	114	75	0	0	189	6	92	0	0	98	1	85	0	0	86	373	
07:30:00	111	61	0	0	172	7	95	0	1	102	1	100	0	0	101	375	
07:45:00	140	65	0	0	205	29	139	0	0	168	5	135	0	0	140	513	1551
08:00:00	132	91	0	0	223	12	131	0	0	143	2	149	0	0	151	517	1778
08:15:00	175	95	0	0	270	23	134	0	0	157	2	167	0	0	169	596	2001
08:30:00	136	75	0	0	211	16	172	0	0	188	2	175	0	0	177	576	2202
08:45:00	160	63	0	0	223	12	158	0	0	170	1	210	0	0	211	604	2293
09:00:00	152	57	0	0	209	27	130	0	0	157	1	187	0	0	188	554	2330
09:15:00	138	55	0	1	193	16	108	0	0	124	4	200	0	0	204	521	2255
09:30:00	137	41	0	0	178	19	104	0	0	123	2	207	0	0	209	510	2189
09:45:00	123	73	0	1	196	16	82	0	0	98	0	222	0	0	222	516	2101
BREAK																	
16:00:00	186	52	0	0	238	21	137	0	0	158	4	407	0	0	411	807	
16:15:00	192	50	0	1	242	33	158	0	0	191	5	389	0	0	394	827	
16:30:00	198	55	0	1	253	18	175	0	1	193	5	421	0	0	426	872	
16:45:00	174	39	1	0	214	30	195	0	0	225	2	392	0	0	394	833	3339
17:00:00	221	43	0	2	264	24	169	0	1	193	8	430	0	0	438	895	3427
17:15:00	205	45	0	0	250	35	168	0	0	203	6	391	0	0	397	850	3450
17:30:00	185	48	0	1	233	31	143	0	1	174	7	417	0	0	424	831	3409
17:45:00	153	59	0	2	212	35	164	0	1	199	7	335	0	0	342	753	3329
18:00:00	201	58	0	1	259	15	133	0	2	148	5	363	0	0	368	775	3209
18:15:00	169	52	0	0	221	30	149	1	0	180	9	323	0	0	332	733	3092
18:30:00	168	40	0	2	208	21	128	0	2	149	5	343	0	0	348	705	2966
18:45:00	160	43	1	0	204	20	168	0	0	188	7	302	0	0	309	701	2914
Grand Total	3828	1391	2	12	5221	503	3300	1	9	3804	93	6409	0	0	6502	**15527**	-
Approach%	73.3%	26.6%	0%		-	13.2%	86.8%	0%		-	1.4%	98.6%	0%		-	-	-
Totals %	24.7%	9%	0%		33.6%	3.2%	21.3%	0%		24.5%	0.6%	41.3%	0%		41.9%	-	-
Heavy	87	33	0		-	11	55	0		-	0	129	0		-	-	-
Heavy %	2.3%	2.4%	0%		-	2.2%	1.7%	0%		-	0%	2%	0%		-	-	-
Bicycles	1	0	0		-	0	0	0		-	0	2	0		-	-	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0%	0%	0%		-	-	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:15:00	175	95	0	0	270	23	134	0	0	157	2	167	0	0	169	596
08:30:00	136	75	0	0	211	16	172	0	0	188	2	175	0	0	177	576
08:45:00	160	63	0	0	223	12	158	0	0	170	1	210	0	0	211	604
09:00:00	152	57	0	0	209	27	130	0	0	157	1	187	0	0	188	554
Grand Total	623	290	0	0	913	78	594	0	0	672	6	739	0	0	745	**2330**
Approach%	68.2%	31.8%	0%		-	11.6%	88.4%	0%		-	0.8%	99.2%	0%		-	-
Totals %	26.7%	12.4%	0%		39.2%	3.3%	25.5%	0%		28.8%	0.3%	31.7%	0%		32%	-
PHF	0.89	0.76	0		0.85	0.72	0.86	0		0.89	0.75	0.88	0		0.88	-
Heavy	19	5	0		24	2	17	0		19	0	32	0		32	-
Heavy %	3%	1.7%	0%		2.6%	2.6%	2.9%	0%		2.8%	0%	4.3%	0%		4.3%	-
Lights	604	285	0		889	76	577	0		653	6	707	0		713	-
Lights %	97%	98.3%	0%		97.4%	97.4%	97.1%	0%		97.2%	100%	95.7%	0%		95.7%	-
Single-Unit Trucks	5	3	0		8	2	9	0		11	0	10	0		10	-
Single-Unit Trucks %	0.8%	1%	0%		0.9%	2.6%	1.5%	0%		1.6%	0%	1.4%	0%		1.3%	-
Buses	12	2	0		14	0	3	0		3	0	18	0		18	-
Buses %	1.9%	0.7%	0%		1.5%	0%	0.5%	0%		0.4%	0%	2.4%	0%		2.4%	-
Articulated Trucks	2	0	0		2	0	5	0		5	0	4	0		4	-
Articulated Trucks %	0.3%	0%	0%		0.2%	0%	0.8%	0%		0.7%	0%	0.5%	0%		0.5%	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

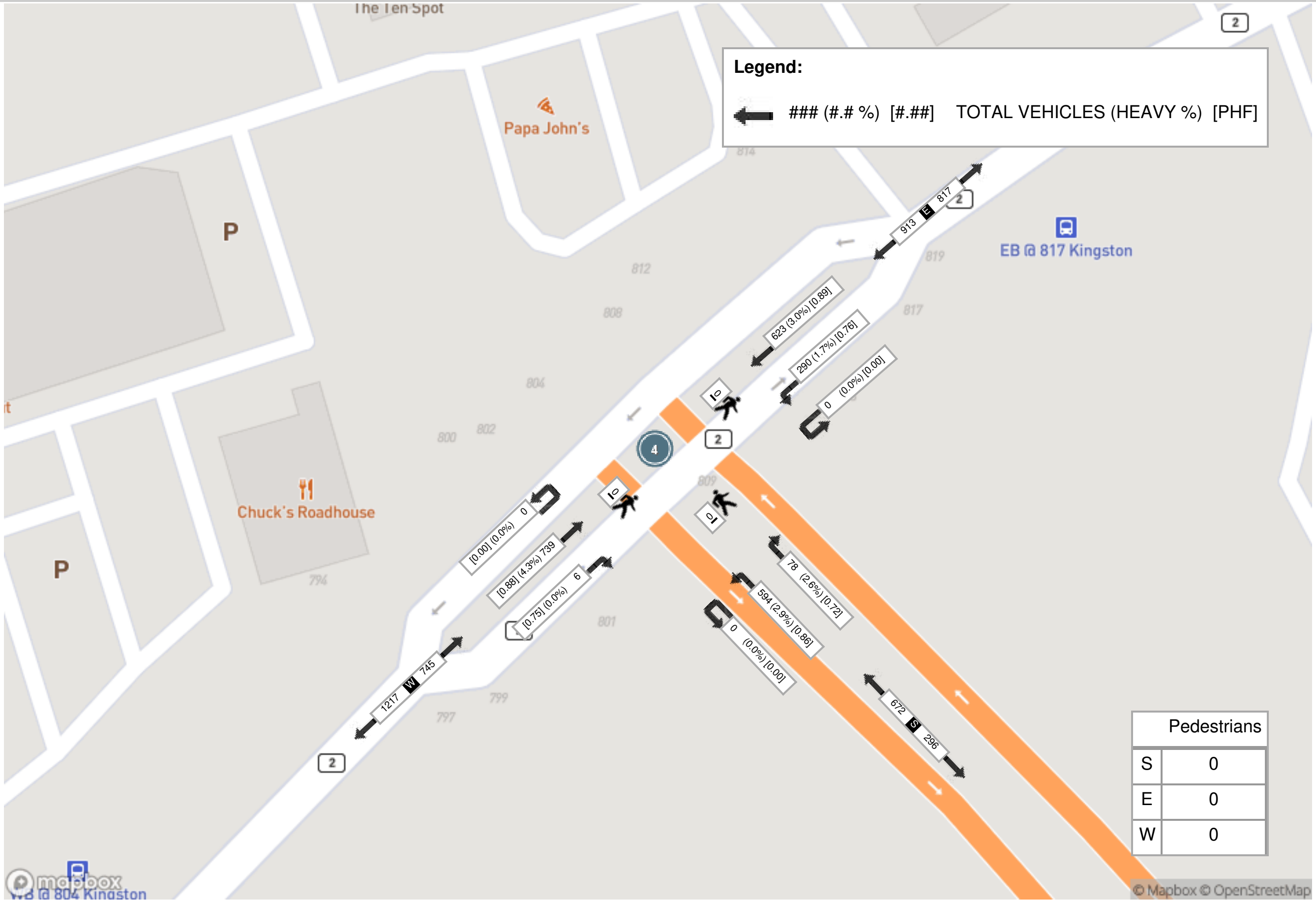
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)

Start Time	E Approach KINGSTON RD					S Approach HWY 401 WB ACCESS					W Approach KINGSTON RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:30:00	198	55	0	1	253	18	175	0	1	193	5	421	0	0	426	872
16:45:00	174	39	1	0	214	30	195	0	0	225	2	392	0	0	394	833
17:00:00	221	43	0	2	264	24	169	0	1	193	8	430	0	0	438	895
17:15:00	205	45	0	0	250	35	168	0	0	203	6	391	0	0	397	850
Grand Total	798	182	1	3	981	107	707	0	2	814	21	1634	0	0	1655	**3450**
Approach%	81.3%	18.6%	0.1%		-	13.1%	86.9%	0%		-	1.3%	98.7%	0%		-	-
Totals %	23.1%	5.3%	0%		28.4%	3.1%	20.5%	0%		23.6%	0.6%	47.4%	0%		48%	-
PHF	0.9	0.83	0.25		0.93	0.76	0.91	0		0.9	0.66	0.95	0		0.94	-
Heavy	10	6	0		16	0	6	0		6	0	15	0		15	-
Heavy %	1.3%	3.3%	0%		1.6%	0%	0.8%	0%		0.7%	0%	0.9%	0%		0.9%	-
Lights	788	176	1		965	107	701	0		808	21	1619	0		1640	-
Lights %	98.7%	96.7%	100%		98.4%	100%	99.2%	0%		99.3%	100%	99.1%	0%		99.1%	-
Single-Unit Trucks	2	2	0		4	0	3	0		3	0	4	0		4	-
Single-Unit Trucks %	0.3%	1.1%	0%		0.4%	0%	0.4%	0%		0.4%	0%	0.2%	0%		0.2%	-
Buses	8	4	0		12	0	2	0		2	0	11	0		11	-
Buses %	1%	2.2%	0%		1.2%	0%	0.3%	0%		0.2%	0%	0.7%	0%		0.7%	-
Articulated Trucks	0	0	0		0	0	1	0		1	0	0	0		0	-
Articulated Trucks %	0%	0%	0%		0%	0%	0.1%	0%		0.1%	0%	0%	0%		0%	-
Pedestrians	-	-	-	3	-	-	-	-	2	-	-	-	-	0	-	-
Pedestrians%	-	-	-	60%		-	-	-	40%		-	-	-	0%		-
Bicycles on Road	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

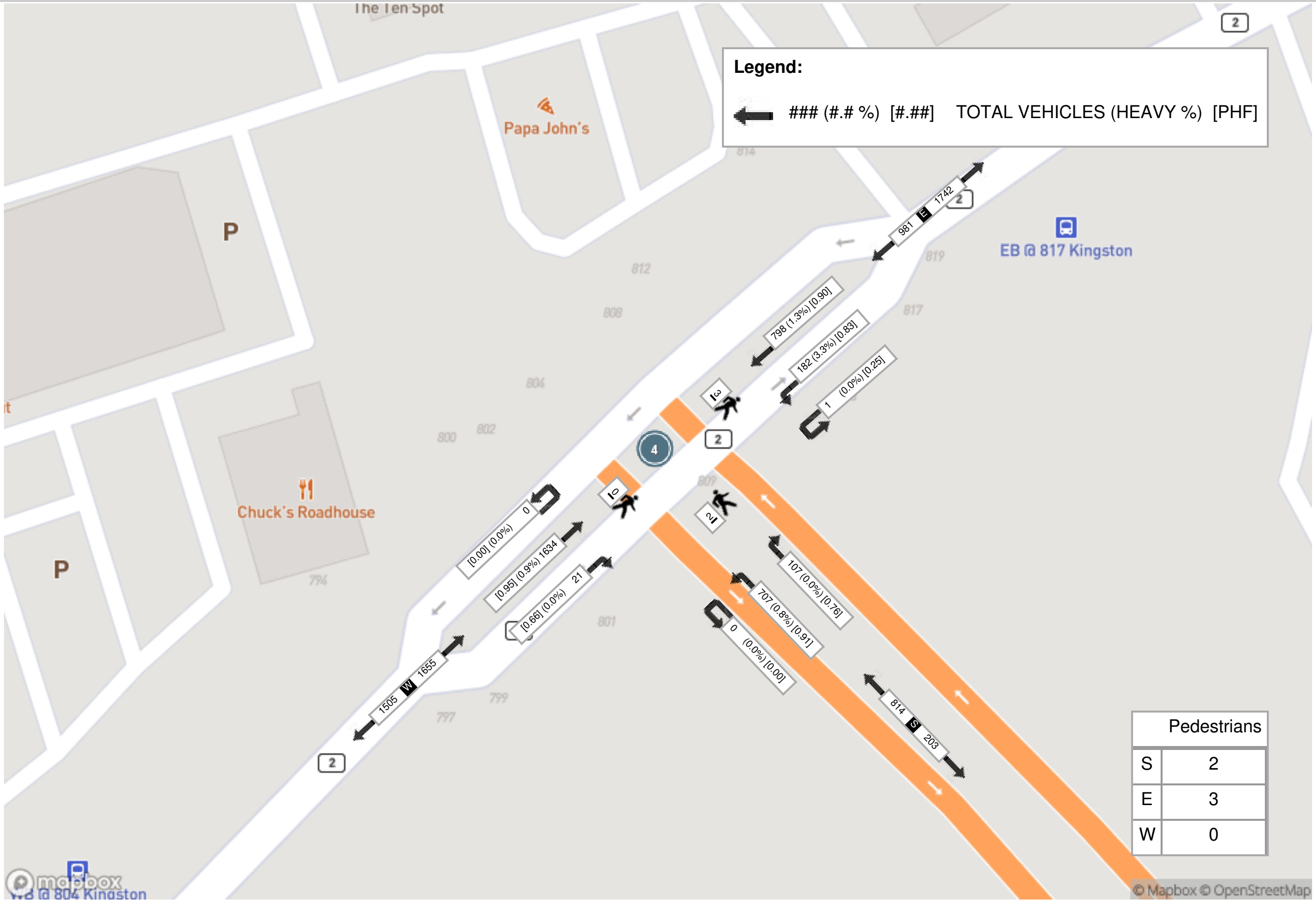
Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (14.7 °C)



Pedestrians	
S	0
E	0
W	0

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (18.84 °C)



Pedestrians	
S	2
E	3
W	0

Turning Movement Count
Location Name: WHITES RD & HWY 401 EB RAMPS
Date: Tue, May 14, 2024 Deployment Lead: David Chu

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (8 . WHITES RD & HWY 401 EB RAMPS)

Start Time	N Approach WHITES RD N					S Approach WHITES RD N					NW Approach HWY 401 EB ON RAMP			E Approach HWY 401 EB ON RAMP			W Approach HWY 401 EB OFF RAMP						Int. Total (15 min)	Int. Total (1 hr)
	Right N:NW	Thru N:S	UTurn N:N	Peds N:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total	UTurn NW:NW	Peds NW:	Approach Total	UTurn E:E	Peds E:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	74	86	0	0	160	26	121	0	0	147	0	2	0	0	1	0	54	0	82	0	2	136	443	
07:15:00	97	114	0	0	211	28	138	0	0	166	0	2	0	0	1	0	83	0	113	0	2	196	573	
07:30:00	117	107	0	0	224	31	137	0	1	168	0	0	0	0	4	0	79	0	120	0	0	199	591	
07:45:00	136	201	0	0	337	46	161	0	0	207	0	0	0	0	3	0	90	0	151	0	0	241	785	2392
08:00:00	151	137	0	0	288	48	215	0	0	263	0	1	0	0	2	0	75	0	135	0	1	210	761	2710
08:15:00	163	127	0	0	290	38	148	0	0	186	0	0	0	0	0	0	88	0	127	0	0	215	691	2828
08:30:00	167	143	0	0	310	39	131	0	0	170	0	1	0	0	0	0	93	0	155	0	1	248	728	2965
08:45:00	185	139	0	0	324	51	163	0	0	214	0	2	0	0	1	0	93	0	185	0	2	278	816	2996
09:00:00	144	111	0	0	255	53	166	0	0	219	0	2	0	0	5	0	72	0	165	0	2	237	711	2946
09:15:00	124	119	0	0	243	41	155	0	0	196	0	7	0	0	1	0	66	0	159	0	7	225	664	2919
09:30:00	116	112	0	0	228	34	127	0	2	161	0	3	0	0	1	0	69	0	122	0	3	191	580	2771
09:45:00	97	81	0	0	178	29	99	0	0	128	0	1	0	0	1	0	72	0	156	0	1	228	534	2489
BREAK																								
16:00:00	73	152	0	0	225	19	187	0	0	206	0	2	0	0	3	0	174	0	356	0	2	530	961	
16:15:00	66	159	0	0	225	23	178	0	0	201	0	0	0	0	5	0	180	0	434	0	0	614	1040	
16:30:00	69	141	0	0	210	35	223	0	1	258	0	9	0	0	0	0	181	0	357	0	18	538	1006	
16:45:00	81	130	0	0	211	29	202	0	0	231	0	17	0	0	7	0	205	0	401	0	7	606	1048	4055
17:00:00	102	134	0	0	236	42	216	0	0	258	0	2	0	0	3	0	156	0	354	0	1	510	1004	4098
17:15:00	59	170	0	0	229	17	229	0	0	246	0	0	0	0	1	0	212	0	411	0	1	623	1098	4156
17:30:00	80	172	0	0	252	22	176	0	0	198	0	1	0	0	0	0	200	0	419	0	1	619	1069	4219
17:45:00	94	142	0	0	236	18	166	0	0	184	0	0	0	0	2	0	181	0	385	0	0	566	986	4157
18:00:00	104	156	0	0	260	28	154	0	0	182	0	1	0	0	1	0	168	0	337	0	1	505	947	4100
18:15:00	118	153	0	0	271	27	116	0	0	143	0	1	0	0	3	0	137	0	329	0	1	466	880	3882
18:30:00	93	130	0	0	223	25	132	0	0	157	0	0	0	0	4	0	136	0	329	0	0	465	845	3658
18:45:00	108	126	0	0	234	14	126	0	0	140	0	0	0	0	3	0	121	0	336	0	0	457	831	3503
Grand Total	2618	3242	0	0	5860	763	3866	0	4	4629	0	54	0	0	52	0	2985	0	6118	0	53	9103	**19592**	-
Approach%	44.7%	55.3%	0%		-	16.5%	83.5%	0%		-	0%		-	0%		-	32.8%	0%	67.2%	0%		-	-	-
Totals %	13.4%	16.5%	0%		29.9%	3.9%	19.7%	0%		23.6%	0%		0%	0%		0%	15.2%	0%	31.2%	0%		46.5%	-	-
Heavy	60	51	0		-	15	74	0		-	0		-	0		-	76	0	101	0		-	-	-
Heavy %	2.3%	1.6%	0%		-	2%	1.9%	0%		-	0%		-	0%		-	2.5%	0%	1.7%	0%		-	-	-
Bicycles	0	1	0		-	0	2	0		-	0		-	0		-	0	0	0	0		-	-	-
Bicycle %	0%	0%	0%		-	0%	0.1%	0%		-	0%		-	0%		-	0%	0%	0%	0%		-	-	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach WHITES RD N					S Approach WHITES RD N					NW Approach HWY 401 EB ON RAMP			E Approach HWY 401 EB ON RAMP			W Approach HWY 401 EB OFF RAMP						Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	151	137	0	0	288	48	215	0	0	263	0	1	0	0	2	0	75	0	135	0	1	210	761
08:15:00	163	127	0	0	290	38	148	0	0	186	0	0	0	0	0	0	88	0	127	0	0	215	691
08:30:00	167	143	0	0	310	39	131	0	0	170	0	1	0	0	0	0	93	0	155	0	1	248	728
08:45:00	185	139	0	0	324	51	163	0	0	214	0	2	0	0	1	0	93	0	185	0	2	278	816
Grand Total	666	546	0	0	1212	176	657	0	0	833	0	4	0	0	3	0	349	0	602	0	4	951	**2996**
Approach%	55%	45%	0%		-	21.1%	78.9%	0%		-	0%		-	0%		-	36.7%	0%	63.3%	0%		-	-
Totals %	22.2%	18.2%	0%		40.5%	5.9%	21.9%	0%		27.8%	0%		0%	0%		0%	11.6%	0%	20.1%	0%		31.7%	-
PHF	0.9	0.95	0		0.94	0.86	0.76	0		0.79	0		0	0		0	0.94	0	0.81	0		0.86	-
Heavy	14	10	0		24	4	24	0		28	0		0	0		0	11	0	28	0		39	-
Heavy %	2.1%	1.8%	0%		2%	2.3%	3.7%	0%		3.4%	0%		0%	0%		0%	3.2%	0%	4.7%	0%		4.1%	-
Lights	652	536	0		1188	172	633	0		805	0		0	0		0	338	0	574	0		912	-
Lights %	97.9%	98.2%	0%		98%	97.7%	96.3%	0%		96.6%	0%		0%	0%		0%	96.8%	0%	95.3%	0%		95.9%	-
Single-Unit Trucks	6	6	0		12	3	12	0		15	0		0	0		0	5	0	15	0		20	-
Single-Unit Trucks %	0.9%	1.1%	0%		1%	1.7%	1.8%	0%		1.8%	0%		0%	0%		0%	1.4%	0%	2.5%	0%		2.1%	-
Buses	7	4	0		11	1	9	0		10	0		0	0		0	2	0	8	0		10	-
Buses %	1.1%	0.7%	0%		0.9%	0.6%	1.4%	0%		1.2%	0%		0%	0%		0%	0.6%	0%	1.3%	0%		1.1%	-
Articulated Trucks	1	0	0		1	0	3	0		3	0		0	0		0	4	0	5	0		9	-
Articulated Trucks %	0.2%	0%	0%		0.1%	0%	0.5%	0%		0.4%	0%		0%	0%		0%	1.1%	0%	0.8%	0%		0.9%	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	4	-	-	2	-	-	-	-	-	4	-	-
Pedestrians%	-	-	-	0%		-	-	-	0%		-	36.4%		-	18.2%		-	-	-	-	36.4%		-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	0%		-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-	1	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	0%		-	9.1%		-	-	-	-	0%		-

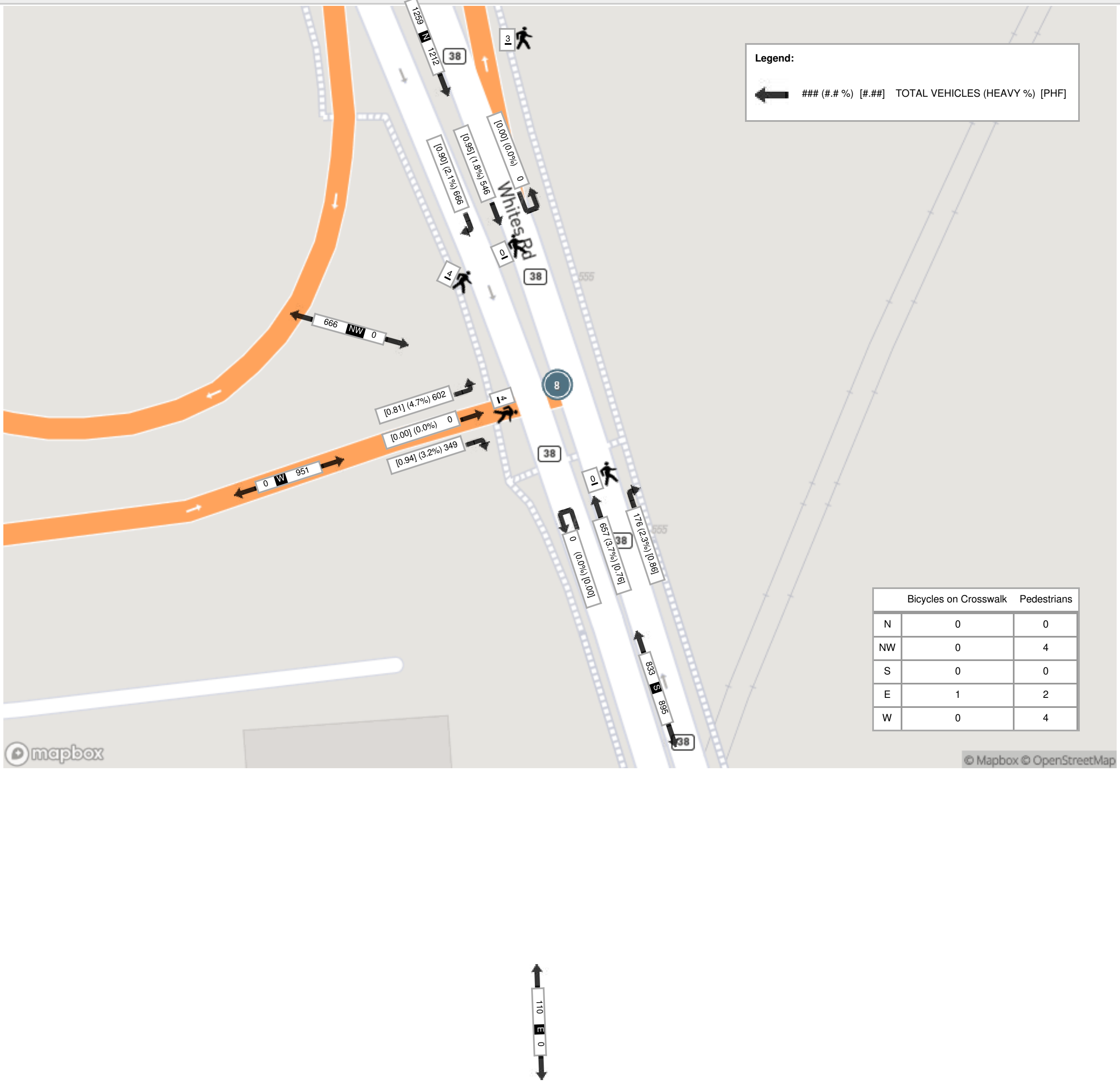
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach WHITES RD N					S Approach WHITES RD N					NW Approach HWY 401 EB ON RAMP			E Approach HWY 401 EB ON RAMP			W Approach HWY 401 EB OFF RAMP						Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	81	130	0	0	211	29	202	0	0	231	0	17	0	0	7	0	205	0	401	0	7	606	1048
17:00:00	102	134	0	0	236	42	216	0	0	258	0	2	0	0	3	0	156	0	354	0	1	510	1004
17:15:00	59	170	0	0	229	17	229	0	0	246	0	0	0	0	1	0	212	0	411	0	1	623	1098
17:30:00	80	172	0	0	252	22	176	0	0	198	0	1	0	0	0	0	200	0	419	0	1	619	1069
Grand Total	322	606	0	0	928	110	823	0	0	933	0	20	0	0	11	0	773	0	1585	0	10	2358	**4219**
Approach%	34.7%	65.3%	0%		-	11.8%	88.2%	0%		-	0%		-	0%		-	32.8%	0%	67.2%	0%		-	-
Totals %	7.6%	14.4%	0%		22%	2.6%	19.5%	0%		22.1%	0%		0%	0%		0%	18.3%	0%	37.6%	0%		55.9%	-
PHF	0.79	0.88	0		0.92	0.65	0.9	0		0.9	0		0	0		0	0.91	0	0.95	0		0.95	-
Heavy	4	7	0		11	1	7	0		8	0		0	0		0	10	0	7	0		17	-
Heavy %	1.2%	1.2%	0%		1.2%	0.9%	0.9%	0%		0.9%	0%		0%	0%		0%	1.3%	0%	0.4%	0%		0.7%	-
Lights	318	599	0		917	109	816	0		925	0		0	0		0	763	0	1578	0		2341	-
Lights %	98.8%	98.8%	0%		98.8%	99.1%	99.1%	0%		99.1%	0%		0%	0%		0%	98.7%	0%	99.6%	0%		99.3%	-
Single-Unit Trucks	3	3	0		6	1	4	0		5	0		0	0		0	8	0	4	0		12	-
Single-Unit Trucks %	0.9%	0.5%	0%		0.6%	0.9%	0.5%	0%		0.5%	0%		0%	0%		0%	1%	0%	0.3%	0%		0.5%	-
Buses	1	3	0		4	0	0	0		0	0		0	0		0	1	0	3	0		4	-
Buses %	0.3%	0.5%	0%		0.4%	0%	0%	0%		0%	0%		0%	0%		0%	0.1%	0%	0.2%	0%		0.2%	-
Articulated Trucks	0	1	0		1	0	3	0		3	0		0	0		0	1	0	0	0		1	-
Articulated Trucks %	0%	0.2%	0%		0.1%	0%	0.4%	0%		0.3%	0%		0%	0%		0%	0.1%	0%	0%	0%		0%	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	19	-	-	10	-	-	-	-	-	9	-	-
Pedestrians%	-	-	-	0%		-	-	-	0%		-	46.3%		-	24.4%		-	-	-	-	22%		-
Bicycles on Road	0	1	0	0	-	0	0	0	0	-	0	0	-	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	0%		-	0%		-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	1	-	-	1	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	2.4%		-	2.4%		-	-	-	-	2.4%		-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

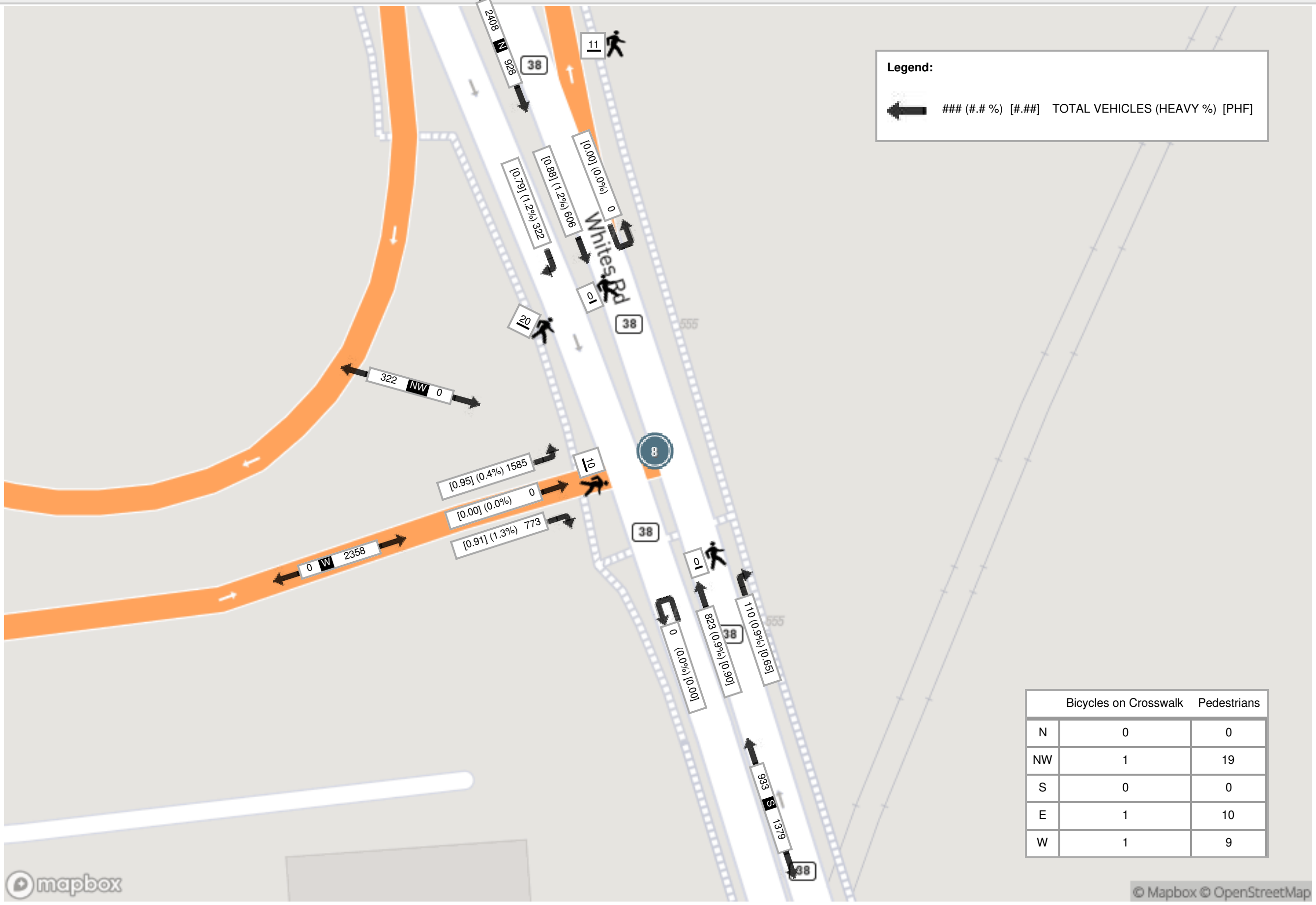
Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
NW	0	4
S	0	0
E	1	2
W	0	4

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
NW	1	19
S	0	0
E	1	10
W	1	9

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (7 . WHITES RD & HWY 401 WB RAMPS)

Start Time	N Approach WHITES RD N					E Approach HWY 401 WB ON RAMP			S Approach WHITES RD N					W Approach HWY 401 WB ON RAMP			Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total	UTurn W:W	Peds W:	Approach Total		
07:00:00	146	154	0	0	300	0	0	0	61	147	0	0	208	0	4	0	508	
07:15:00	153	210	0	0	363	0	5	0	56	179	0	0	235	0	2	0	598	
07:30:00	147	217	0	0	364	0	4	0	79	187	0	0	266	0	0	0	630	
07:45:00	151	345	0	0	496	0	0	0	66	233	0	0	299	0	0	0	795	2531
08:00:00	166	294	0	0	460	0	2	0	93	264	0	0	357	0	1	0	817	2840
08:15:00	161	290	0	0	451	0	0	0	59	224	0	0	283	0	0	0	734	2976
08:30:00	135	310	0	0	445	0	1	0	61	214	0	0	275	0	1	0	720	3066
08:45:00	129	318	0	0	447	0	1	0	62	297	0	0	359	0	1	0	806	3077
09:00:00	116	242	0	0	358	0	5	0	54	262	0	0	316	0	1	0	674	2934
09:15:00	99	254	0	0	353	0	1	0	56	274	0	0	330	0	8	0	683	2883
09:30:00	131	229	0	0	360	0	1	0	64	192	0	0	256	0	5	0	616	2779
09:45:00	123	181	0	0	304	0	1	0	42	223	0	0	265	0	1	0	569	2542
BREAK																		
16:00:00	102	215	0	0	317	0	3	0	49	493	0	0	542	0	2	0	859	
16:15:00	88	224	0	0	312	0	6	0	52	533	0	0	585	0	2	0	897	
16:30:00	81	209	0	0	290	0	0	0	51	524	0	0	575	0	4	0	865	
16:45:00	109	231	0	0	340	0	7	0	47	560	0	0	607	0	23	0	947	3568
17:00:00	111	247	0	0	358	0	3	0	68	519	0	0	587	0	2	0	945	3654
17:15:00	107	226	0	0	333	0	1	0	48	556	0	0	604	0	0	0	937	3694
17:30:00	87	233	0	0	320	0	0	0	60	564	0	0	624	0	1	0	944	3773
17:45:00	110	235	0	0	345	0	2	0	40	506	0	0	546	0	0	0	891	3717
18:00:00	99	267	0	0	366	0	2	0	36	469	0	0	505	0	2	0	871	3643
18:15:00	94	270	0	0	364	0	3	0	33	422	0	0	455	0	0	0	819	3525
18:30:00	75	228	0	0	303	0	3	0	26	433	0	0	459	0	0	0	762	3343
18:45:00	98	231	0	0	329	0	2	0	43	427	0	0	470	0	0	0	799	3251
Grand Total	2818	5860	0	0	8678	0	53	0	1306	8702	0	0	10008	0	60	0	**18686**	-
Approach%	32.5%	67.5%	0%		-	0%		-	13%	87%	0%		-	0%		-	-	-
Totals %	15.1%	31.4%	0%		46.4%	0%		0%	7%	46.6%	0%		53.6%	0%		0%	-	-
Heavy	29	110	0		-	0		-	34	142	0		-	0		-	-	-
Heavy %	1%	1.9%	0%		-	0%		-	2.6%	1.6%	0%		-	0%		-	-	-
Bicycles	0	1	0		-	0		-	0	2	0		-	0		-	-	-
Bicycle %	0%	0%	0%		-	0%		-	0%	0%	0%		-	0%		-	-	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)

Start Time	N Approach WHITES RD N					E Approach HWY 401 WB ON RAMP			S Approach WHITES RD N					W Approach HWY 401 WB ON RAMP			Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	
08:00:00	166	294	0	0	460	0	2	0	93	264	0	0	357	0	1	0	817
08:15:00	161	290	0	0	451	0	0	0	59	224	0	0	283	0	0	0	734
08:30:00	135	310	0	0	445	0	1	0	61	214	0	0	275	0	1	0	720
08:45:00	129	318	0	0	447	0	1	0	62	297	0	0	359	0	1	0	806
Grand Total	591	1212	0	0	1803	0	4	0	275	999	0	0	1274	0	3	0	**3077**
Approach%	32.8%	67.2%	0%		-	0%		-	21.6%	78.4%	0%		-	0%		-	-
Totals %	19.2%	39.4%	0%		58.6%	0%		0%	8.9%	32.5%	0%		41.4%	0%		0%	-
PHF	0.89	0.95	0		0.98	0		0	0.74	0.84	0		0.89	0		0	-
Heavy	3	24	0		27	0		0	10	43	0		53	0		0	-
Heavy %	0.5%	2%	0%		1.5%	0%		0%	3.6%	4.3%	0%		4.2%	0%		0%	-
Lights	588	1188	0		1776	0		0	265	956	0		1221	0		0	-
Lights %	99.5%	98%	0%		98.5%	0%		0%	96.4%	95.7%	0%		95.8%	0%		0%	-
Single-Unit Trucks	2	12	0		14	0		0	8	20	0		28	0		0	-
Single-Unit Trucks %	0.3%	1%	0%		0.8%	0%		0%	2.9%	2%	0%		2.2%	0%		0%	-
Buses	0	11	0		11	0		0	0	17	0		17	0		0	-
Buses %	0%	0.9%	0%		0.6%	0%		0%	0%	1.7%	0%		1.3%	0%		0%	-
Articulated Trucks	1	1	0		2	0		0	2	6	0		8	0		0	-
Articulated Trucks %	0.2%	0.1%	0%		0.1%	0%		0%	0.7%	0.6%	0%		0.6%	0%		0%	-
Pedestrians	-	-	-	0	-	-	3	-	-	-	-	0	-	-	3	-	-
Pedestrians%	-	-	-	0%		-	42.9%		-	-	-	0%		-	42.9%		-
Bicycles on Road	0	0	0	0	-	0	0	-	0	0	0	0	-	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	0%		-	-	-	0%		-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	1	-	-	-	-	0	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	14.3%		-	-	-	0%		-	0%		-

Spectrum

Turning Movement Count
Location Name: WHITES RD & HWY 401 WB RAMPS
Date: Tue, May 14, 2024 Deployment Lead: David Chu

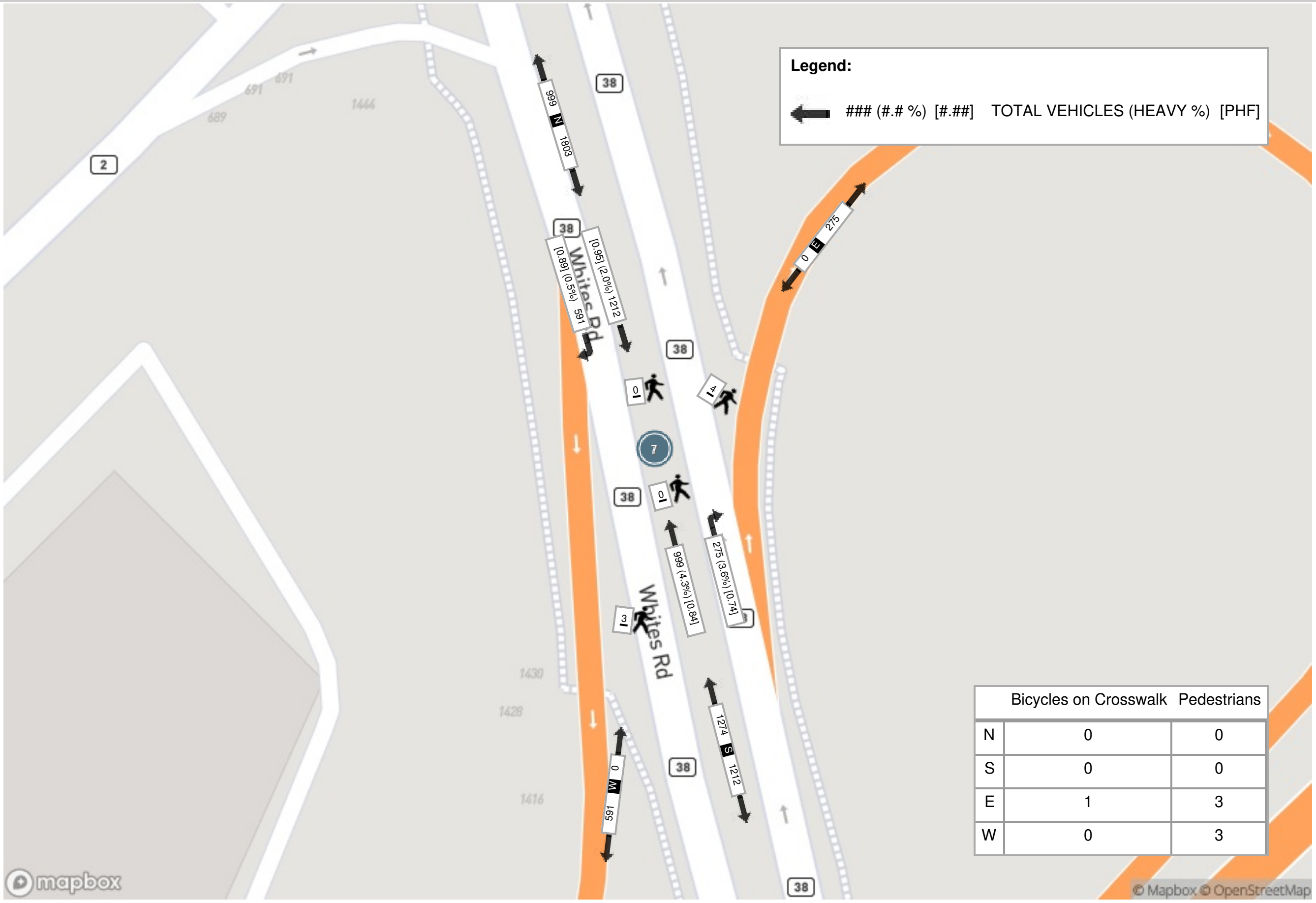
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)

Start Time	N Approach WHITES RD N					E Approach HWY 401 WB ON RAMP			S Approach WHITES RD N					W Approach HWY 401 WB ON RAMP			Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	UTurn	Peds	Approach Total	
16:45:00	109	231	0	0	340	0	7	0	47	560	0	0	607	0	23	0	947
17:00:00	111	247	0	0	358	0	3	0	68	519	0	0	587	0	2	0	945
17:15:00	107	226	0	0	333	0	1	0	48	556	0	0	604	0	0	0	937
17:30:00	87	233	0	0	320	0	0	0	60	564	0	0	624	0	1	0	944
Grand Total	414	937	0	0	1351	0	11	0	223	2199	0	0	2422	0	26	0	**3773**
Approach%	30.6%	69.4%	0%		-	0%		-	9.2%	90.8%	0%		-	0%		-	-
Totals %	11%	24.8%	0%		35.8%	0%		0%	5.9%	58.3%	0%		64.2%	0%		0%	-
PHF	0.93	0.95	0		0.94	0		0	0.82	0.97	0		0.97	0		0	-
Heavy	4	10	0		14	0		0	6	10	0		16	0		0	-
Heavy %	1%	1.1%	0%		1%	0%		0%	2.7%	0.5%	0%		0.7%	0%		0%	-
Lights	410	927	0		1337	0		0	217	2189	0		2406	0		0	-
Lights %	99%	98.9%	0%		99%	0%		0%	97.3%	99.5%	0%		99.3%	0%		0%	-
Single-Unit Trucks	4	6	0		10	0		0	4	5	0		9	0		0	-
Single-Unit Trucks %	1%	0.6%	0%		0.7%	0%		0%	1.8%	0.2%	0%		0.4%	0%		0%	-
Buses	0	3	0		3	0		0	0	4	0		4	0		0	-
Buses %	0%	0.3%	0%		0.2%	0%		0%	0%	0.2%	0%		0.2%	0%		0%	-
Articulated Trucks	0	1	0		1	0		0	2	1	0		3	0		0	-
Articulated Trucks %	0%	0.1%	0%		0.1%	0%		0%	0.9%	0%	0%		0.1%	0%		0%	-
Pedestrians	-	-	-	0	-	-	10	-	-	-	-	0	-	-	23	-	-
Pedestrians%	-	-	-	0%		-	27%		-	-	-	0%		-	62.2%		-
Bicycles on Road	0	1	0	0	-	0	0	-	0	0	0	0	-	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	0%		-	-	-	0%		-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	1	-	-	-	-	0	-	-	3	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	2.7%		-	-	-	0%		-	8.1%		-

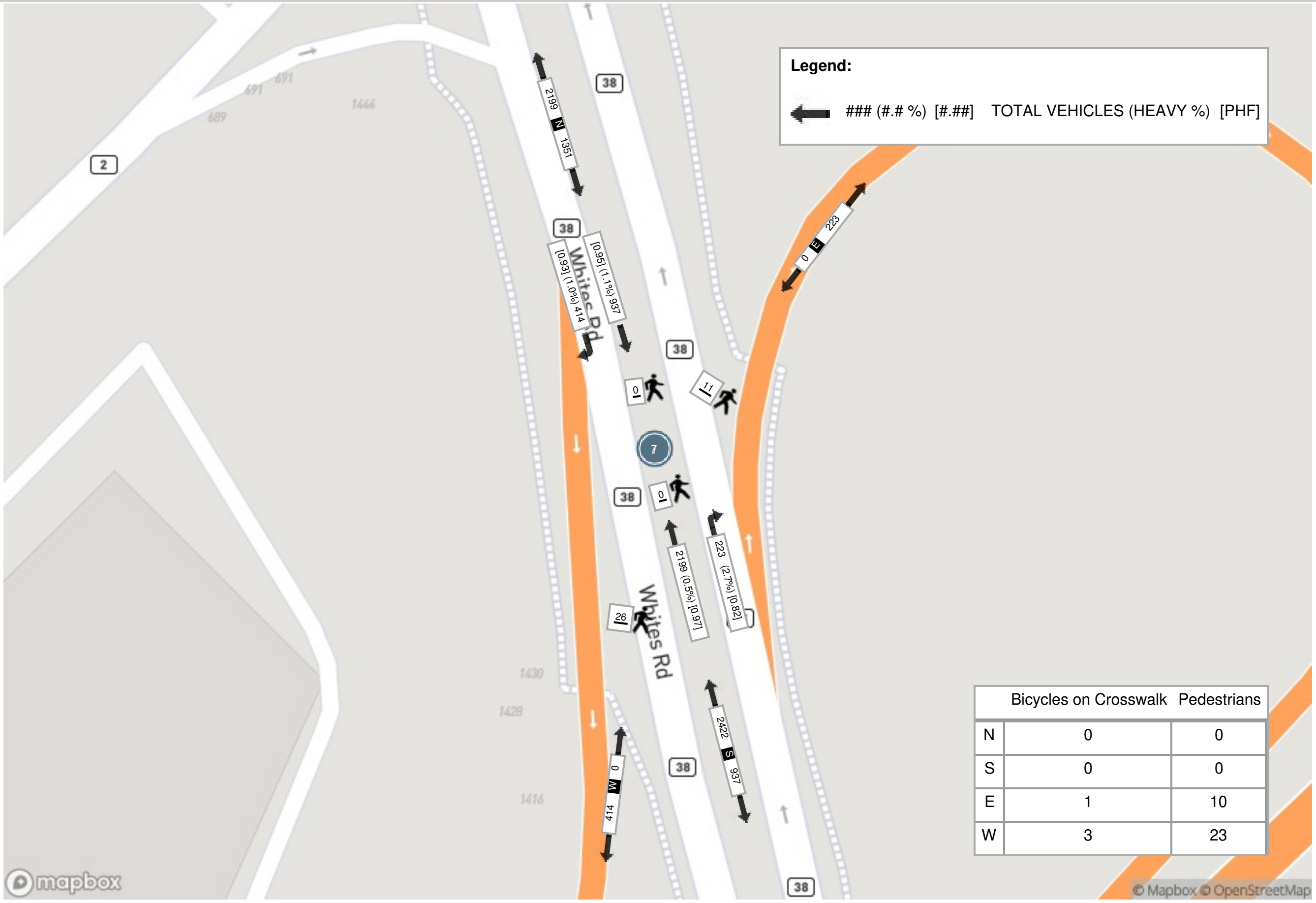
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (14.7 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
E	1	3
W	0	3

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (18.84 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
E	1	10
W	3	23

Appendix K:
Existing Signal Timing Plans

INTERSECTION SIGNAL TIMING REPORT

DURHAM REGION

Location	Kingston Road (Hwy 2) and Whites Road (RR38)				
Date	13-05-24	C&E No.	55380815	Prepared by	N. Mimay
Prepared for	BA Group				

AM Peak 05:30 - 09:00

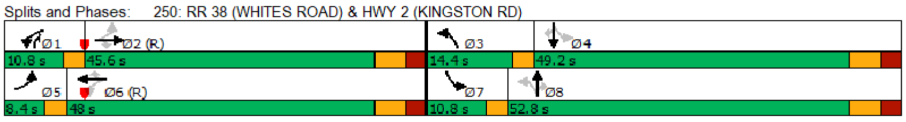
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	10.8	45.6	14.4	49.2	8.4	48	10.8	52.8
Maximum Split (%)	9.0%	38.0%	12.0%	41.0%	7.0%	40.0%	9.0%	44.0%
Minimum Split (s)	8	43	8	45	8	43	8	45
Yellow Time (s)	3	4.2	3	4.3	3	4.2	3	4.3
All-Red Time (s)	0	2.8	0	2.8	0	2.8	0	2.8
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	0.2	3	0.2	3	0.2	3	0.2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		29		30		29		30

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105

Offset: 1.2 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Splits and Phases: 250: RR 38 (WHITES ROAD) & HWY 2 (KINGSTON RD)



PM Peak (14:30-20:00)

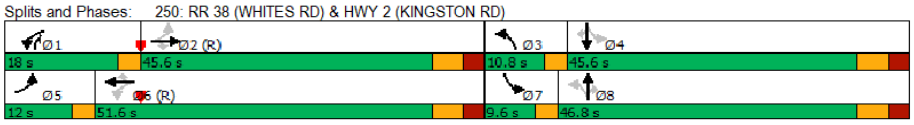
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	18	45.6	10.8	45.6	12	51.6	9.6	46.8
Maximum Split (%)	15.0%	38.0%	9.0%	38.0%	10.0%	43.0%	8.0%	39.0%
Minimum Split (s)	8	43	8	45	8	43	8	45
Yellow Time (s)	3	4.2	3	4.3	3	4.2	3	4.3
All-Red Time (s)	0	2.8	0	2.8	0	2.8	0	2.8
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	0.2	3	0.2	3	0.2	3	0.2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		29		30		29		30

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105

Offset: 1.2 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Splits and Phases: 250: RR 38 (WHITES RD) & HWY 2 (KINGSTON RD)



Weekend Peak 8:00-21:00

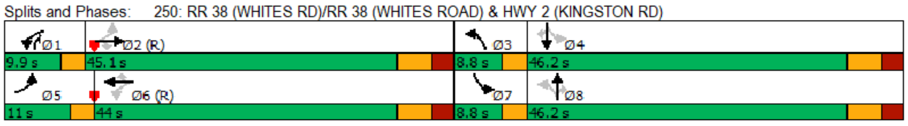
Phase Number	1	2	3	4	5	6	7	8
Movement	WBL	EBTL	NBL	SBTL	EBL	WBTL	SBL	NBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	Max	None	C-Max	None	Max
Maximum Split (s)	9.9	45.1	8.8	46.2	11	44	8.8	46.2
Maximum Split (%)	9.0%	41.0%	8.0%	42.0%	10.0%	40.0%	8.0%	42.0%
Minimum Split (s)	8	43	8	45	8	43	8	45
Yellow Time (s)	3	4.2	3	4.3	3	4.2	3	4.3
All-Red Time (s)	0	2.8	0	2.8	0	2.8	0	2.8
Minimum Initial (s)	5	20	5	8	5	20	5	8
Vehicle Extension (s)	3	0.2	3	0.2	3	0.2	3	0.2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		29		30		29		30

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	105

Offset: 1.1 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Splits and Phases: 250: RR 38 (WHITES RD)/RR 38 (WHITES ROAD) & HWY 2 (KINGSTON RD)



**Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.*

INTERSECTION SIGNAL TIMING REPORT

DURHAM REGION

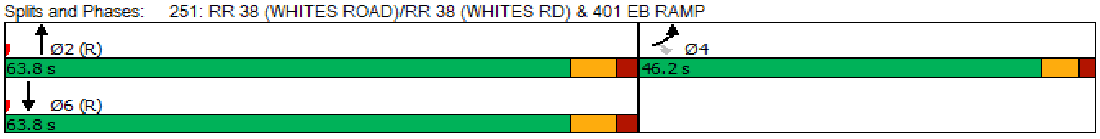
Location	Whites Rd. (RR 38) and Hwy. 401 EB Off-Ramp				
Date	13-05-24	C&E No.	55380815	Prepared by	N. Mimay
Prepared for	BA Group				

AM Peak (6:15-9:15)

Phase Number	2	4	6
Movement	NBT	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	C-Max	None	C-Max
Maximum Split (s)	63.8	46.2	63.8
Maximum Split (%)	58.0%	42.0%	58.0%
Minimum Split (s)	28.9	29.6	28.9
Yellow Time (s)	4.6	3.8	4.6
All-Red Time (s)	2.3	1.8	2.3
Minimum Initial (s)	20	8	20
Vehicle Extension (s)	0.2	3	0.2
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	7	7	7
Flash Dont Walk (s)	15	17	15

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 251: RR 38 (WHITES ROAD)/RR 38 (WHITES RD) & 401 EB RAMP

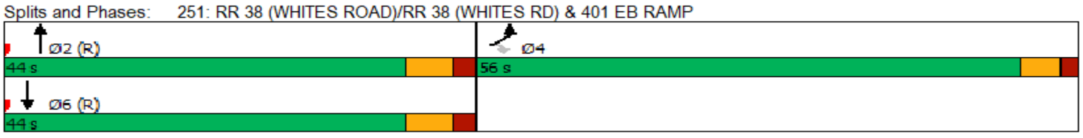


PM Peak 14:30 - 19:00

Phase Number	2	4	6
Movement	NBT	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	C-Max	None	C-Max
Maximum Split (s)	44	56	44
Maximum Split (%)	44.0%	56.0%	44.0%
Minimum Split (s)	28	29	28
Yellow Time (s)	4.5	3.7	4.5
All-Red Time (s)	2.2	1.8	2.2
Minimum Initial (s)	20	8	20
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	7	7	7
Flash Dont Walk (s)	14	16	14

Intersection Summary	
Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 251: RR 38 (WHITES ROAD)/RR 38 (WHITES RD) & 401 EB RAMP

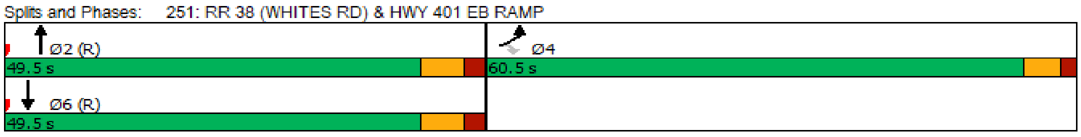


Weekend Peak (08:00-21:00)

Phase Number	2	4	6
Movement	NBT	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	C-Max	None	C-Max
Maximum Split (s)	49.5	60.5	49.5
Maximum Split (%)	45.0%	55.0%	45.0%
Minimum Split (s)	28.9	29.6	28.9
Yellow Time (s)	4.6	3.8	4.6
All-Red Time (s)	2.3	1.8	2.3
Minimum Initial (s)	20	8	20
Vehicle Extension (s)	0.2	3	0.2
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	7	7	7
Flash Dont Walk (s)	15	17	15

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 24.2 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 251: RR 38 (WHITES RD) & HWY 401 EB RAMP



**Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.*

INTERSECTION SIGNAL TIMING REPORT

DURHAM REGION

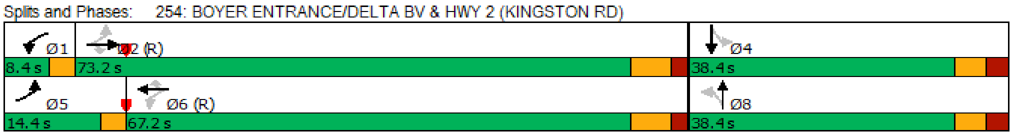
Location	Kingston Rd & Delta / Boyer				
Date	10-05-24	C&E No.	55380815	Prepared by	N. Mimay
Prepared for	BA Group				

AM Peak (6:00-9:30)

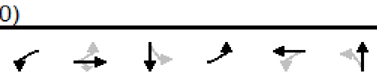
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	8.4	73.2	38.4	14.4	67.2	38.4
Maximum Split (%)	7.0%	61.0%	32.0%	12.0%	56.0%	32.0%
Minimum Split (s)	8	31.9	37.6	8	31.9	37.6
Yellow Time (s)	3	4.7	3.8	3	4.7	3.8
All-Red Time (s)	0	2.2	2.8	0	2.2	2.8
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	0.2	3	3	0.2	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 105.6 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 254: BOYER ENTRANCE/DELTA BV & HWY 2 (KINGSTON RD)



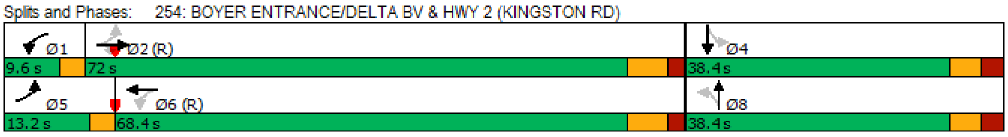
PM Peak (14:00-19:00)



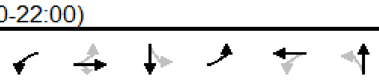
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	9.6	72	38.4	13.2	68.4	38.4
Maximum Split (%)	8.0%	60.0%	32.0%	11.0%	57.0%	32.0%
Minimum Split (s)	8	32	38	8	32	38
Yellow Time (s)	3	4.7	3.8	3	4.7	3.8
All-Red Time (s)	0	2.2	2.8	0	2.2	2.8
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	0.2	3	3	0.2	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 111.6 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 254: BOYER ENTRANCE/DELTA BV & HWY 2 (KINGSTON RD)



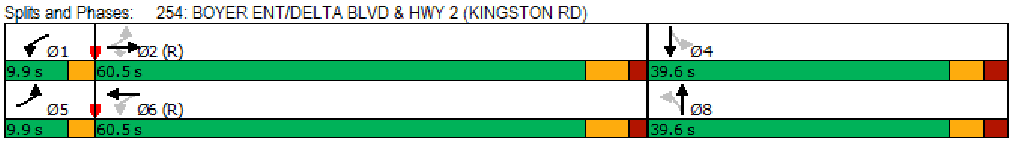
Weekend Peak (09:00-22:00)



Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	9.9	60.5	39.6	9.9	60.5	39.6
Maximum Split (%)	9.0%	55.0%	36.0%	9.0%	55.0%	36.0%
Minimum Split (s)	8	32	38	8	32	38
Yellow Time (s)	3	4.7	3.8	3	4.7	3.8
All-Red Time (s)	0	2.2	2.8	0	2.2	2.8
Minimum Initial (s)	5	20	8	5	20	8
Vehicle Extension (s)	3	0.2	3	3	0.2	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		18	24		18	24

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 103.4 (94%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	

Splits and Phases: 254: BOYER ENT/DELTA BLVD & HWY 2 (KINGSTON RD)



Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.

INTERSECTION SIGNAL TIMING REPORT

DURHAM REGION

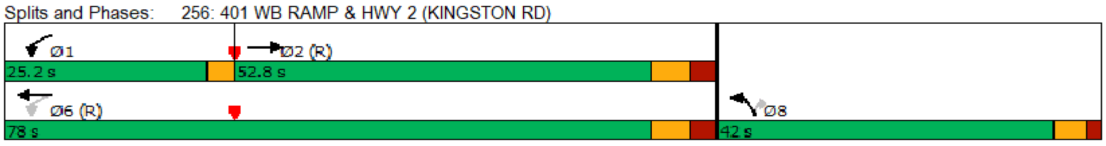
Location	Kingston Rd & Hwy 401 Ramp (E of Whites Rd.)				
Date	24-05-23	**C&E No.**	55380815	**Prepared by**	N. Mimay
Prepared for	BA Group				

AM Peak 05:30 - 09:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	25.2	52.8	78	42
Maximum Split (%)	21.0%	44.0%	65.0%	35.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 115.2 (96%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Splits and Phases: 256: 401 WB RAMP & HWY 2 (KINGSTON RD)

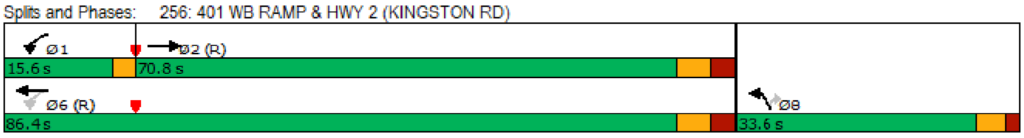


PM Peak 14:30-20:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	15.6	70.8	86.4	33.6
Maximum Split (%)	13.0%	59.0%	72.0%	28.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 8.4 (7%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Splits and Phases: 256: 401 WB RAMP & HWY 2 (KINGSTON RD)

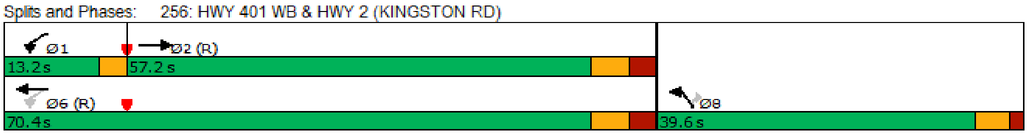


Weekend Peak 08:00 - 21:00

Phase Number	1	2	6	8
Movement	WBL	EBT	WBTL	NBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None
Maximum Split (s)	13.2	57.2	70.4	39.6
Maximum Split (%)	12.0%	52.0%	64.0%	36.0%
Minimum Split (s)	8	50	50	32
Yellow Time (s)	3	4.2	4.2	3.7
All-Red Time (s)	0	3	3	1.7
Minimum Initial (s)	5	20	20	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7	7	7
Flash Dont Walk (s)		35	35	19

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 22 (20%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	

Splits and Phases: 256: HWY 401 WB & HWY 2 (KINGSTON RD)



**Please note a concerted effort has been made to ensure the accuracy and completeness of the data provided, however, inadvertent errors or omissions can still occur. Please bring any errors or omissions to the Region's attention.*

Appendix L:
Synchro Results

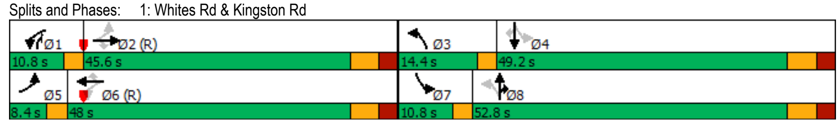
Existing Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	280	360	290	600	325	180	450	375	140	1150	105
Future Volume (vph)	75	280	360	290	600	325	180	450	375	140	1150	105
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	8.0	43.0	43.0	8.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	8.4	45.6	45.6	10.8	48.0	48.0	14.4	52.8		10.8	49.2	49.2
Total Split (%)	7.0%	38.0%	38.0%	9.0%	40.0%	40.0%	12.0%	44.0%		9.0%	41.0%	41.0%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	0.0	2.8	2.8	0.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	2.0	6.0	6.0	2.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max		None	Max	Max
Act Effct Green (s)	50.0	39.6	39.6	54.4	43.7	43.7	63.1	46.7	57.5	56.7	43.8	43.8
Actuated g/C Ratio	0.42	0.33	0.33	0.45	0.36	0.36	0.53	0.39	0.48	0.47	0.36	0.36
v/c Ratio	0.26	0.27	0.61	0.63	0.51	0.46	0.65	0.25	0.44	0.32	0.67	0.18
Control Delay	21.2	30.3	20.6	22.0	23.9	7.5	28.9	25.2	4.6	17.8	34.3	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	30.3	20.6	22.0	23.9	7.5	28.9	25.2	4.6	17.8	34.3	4.9
LOS	C	C	C	C	C	A	C	C	A	B	C	A
Approach Delay		24.5			19.1			18.2			30.4	
Approach LOS		C			B			B			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1.2 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 23.4 Intersection LOS: C
Intersection Capacity Utilization 103.6% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	280	360	290	600	325	180	450	375	140	1150	105
Future Volume (vph)	75	280	360	290	600	325	180	450	375	140	1150	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	6.0	6.0	2.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1779	3400	1505	1816	3433	1468	1818	4932	1487	1775	5029	1483
Flt Permitted	0.33	1.00	1.00	0.52	1.00	1.00	0.12	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	579	3400	1505	943	3433	1468	226	4932	1487	832	5029	1483
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	80	298	383	309	638	346	191	479	399	149	1223	112
RTOR Reduction (vph)	0	0	131	0	0	222	0	0	174	0	0	71
Lane Group Flow (vph)	80	298	252	309	638	124	191	479	225	149	1223	41
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	42.9	38.6	38.6	49.4	42.1	42.1	56.4	45.7	60.6	50.6	42.8	42.8
Effective Green, g (s)	44.9	39.6	39.6	50.4	43.1	43.1	59.0	46.7	61.6	52.6	43.8	43.8
Actuated g/C Ratio	0.37	0.33	0.33	0.42	0.36	0.36	0.49	0.39	0.51	0.44	0.36	0.36
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	1122	496	460	1233	527	286	1919	763	433	1835	541
v/s Ratio Prot	0.01	0.09		c0.05	c0.19		c0.07	0.10	0.15	0.03	c0.24	
v/s Ratio Perm	0.10		0.17	0.23		0.08	0.26			0.13		0.03
v/c Ratio	0.30	0.27	0.51	0.67	0.52	0.24	0.67	0.25	0.30	0.34	0.67	0.08
Uniform Delay, d1	24.9	29.5	32.4	26.2	30.3	26.9	20.4	24.8	16.7	20.7	32.0	24.9
Progression Factor	1.00	1.00	1.00	0.70	0.74	1.88	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	3.7	3.5	1.4	1.0	5.8	0.3	0.2	0.5	1.9	0.3
Delay (s)	25.5	30.1	36.1	22.0	23.8	51.6	26.2	25.1	17.0	21.1	33.9	25.2
Level of Service	C	C	D	C	C	D	C	C	B	C	C	C
Approach Delay (s)		32.6			30.8			22.3			32.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	95	685	10	20	1095	105	40	0	60	10
Future Volume (vph)	95	685	10	20	1095	105	40	0	60	10
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	31.9	31.9	8.0	31.9	31.9	37.6	37.6	37.6	37.6
Total Split (s)	14.4	73.2	73.2	8.4	67.2	67.2	38.4	38.4	38.4	38.4
Total Split (%)	12.0%	61.0%	61.0%	7.0%	56.0%	56.0%	32.0%	32.0%	32.0%	32.0%
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.8	3.8	3.8	3.8
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	2.0	5.9	5.9	2.0	5.9	5.9	5.6	5.6		5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	100.2	92.9	92.9	97.6	86.9	86.9	11.9	11.9		11.9
Actuated g/C Ratio	0.84	0.77	0.77	0.81	0.72	0.72	0.10	0.10		0.10
v/c Ratio	0.25	0.28	0.01	0.04	0.46	0.10	0.49	0.05		0.55
Control Delay	3.5	4.6	0.0	1.4	9.6	2.0	68.7	0.2		23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	3.5	4.6	0.0	1.4	9.6	2.0	68.7	0.2		23.4
LOS	A	A	A	A	A	A	E	A		C
Approach Delay		4.4			8.8			46.3		23.4
Approach LOS		A			A			D		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105.6 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

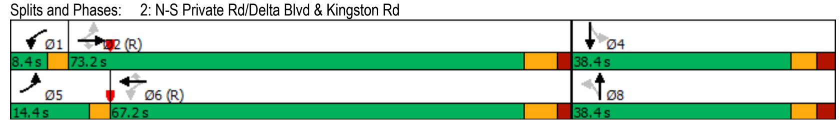
Maximum v/c Ratio: 0.55

Intersection Signal Delay: 9.6 Intersection LOS: A

Intersection Capacity Utilization 72.4% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: N-S Private Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	685	10	20	1095	105	40	0	20	60	10	135
Future Volume (vph)	95	685	10	20	1095	105	40	0	20	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	5.9	5.9	2.0	5.9	5.9	5.6	5.6			5.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85			0.90	
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			0.99	
Satd. Flow (prot)	1836	3400	1561	1611	3466	1512	1709	1426			3129	
Flt Permitted	0.21	1.00	1.00	0.37	1.00	1.00	0.52	1.00			0.86	
Satd. Flow (perm)	380	3400	1561	604	3466	1512	892	1426			2735	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	101	729	11	21	1165	112	43	0	21	64	11	144
RTOR Reduction (vph)	0	0	3	0	0	24	0	19	0	0	130	0
Lane Group Flow (vph)	101	729	8	21	1165	88	43	2	0	0	89	0
Confl. Peds. (#/hr)	5					5			5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	95.6	90.2	90.2	88.3	85.9	85.9	10.9	10.9			10.9	
Effective Green, g (s)	96.6	91.2	91.2	90.3	86.9	86.9	11.9	11.9			11.9	
Actuated g/C Ratio	0.80	0.76	0.76	0.75	0.72	0.72	0.10	0.10			0.10	
Clearance Time (s)	3.0	6.9	6.9	3.0	6.9	6.9	6.6	6.6			6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	399	2584	1186	483	2509	1094	88	141			271	
v/s Ratio Prot	c0.02	0.21		0.00	c0.34			0.00				
v/s Ratio Perm	0.19		0.01	0.03		0.06	c0.05				0.03	
v/c Ratio	0.25	0.28	0.01	0.04	0.46	0.08	0.49	0.01			0.33	
Uniform Delay, d1	3.4	4.4	3.5	3.7	6.9	4.8	51.2	48.8			50.3	
Progression Factor	1.07	0.93	1.00	0.61	1.22	0.94	1.00	1.00			1.00	
Incremental Delay, d2	0.3	0.3	0.0	0.0	0.6	0.1	4.2	0.0			0.7	
Delay (s)	3.9	4.4	3.5	2.3	9.0	4.7	55.4	48.8			51.1	
Level of Service	A	A	A	A	A	A	E	D			D	
Approach Delay (s)		4.3			8.5			53.2			51.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	725	5	20	1180	30	0	0	10	15	0	40
Future Volume (Veh/h)	35	725	5	20	1180	30	0	0	10	15	0	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	38	780	5	22	1269	32	0	0	11	16	0	43
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		134			134							
pX, platoon unblocked	0.93			0.94			0.96	0.96	0.94	0.96	0.96	0.93
vC, conflicting volume	1306			785			1578	2206	390	1795	2179	640
vC1, stage 1 conf vol							856	856		1318	1318	
vC2, stage 2 conf vol							722	1350		477	861	
vCu, unblocked vol	1182			655			1258	1913	237	1484	1884	467
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			98			100	100	98	91	100	91
cM capacity (veh/h)	524			889			263	172	728	174	200	501

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	38	390	390	5	22	634	634	32	0	11	16	43
Volume Left	38	0	0	0	22	0	0	0	0	0	16	0
Volume Right	0	0	0	5	0	0	0	32	0	11	0	43
cSH	524	1700	1700	1700	889	1700	1700	1700	1700	728	174	501
Volume to Capacity	0.07	0.23	0.23	0.00	0.02	0.37	0.37	0.02	0.00	0.02	0.09	0.09
Queue Length 95th (m)	1.9	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.4	2.4	2.2
Control Delay (s)	12.4	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	10.0	27.8	12.9
Lane LOS	B				A				A	B	D	B
Approach Delay (s)	0.6				0.2				10.0		16.9	
Approach LOS									B		C	

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	745	290	635	595	80
Future Volume (vph)	745	290	635	595	80
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	52.8	25.2	78.0	42.0	42.0
Total Split (%)	44.0%	21.0%	65.0%	35.0%	35.0%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	2.0	6.2	4.4	4.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	C-Max	None	None
Act Effct Green (s)	65.5	85.6	81.4	28.0	28.0
Actuated g/C Ratio	0.55	0.71	0.68	0.23	0.23
v/c Ratio	0.42	0.58	0.28	0.77	0.20
Control Delay	16.6	11.2	8.5	49.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	11.2	8.5	49.5	8.4
LOS	B	B	A	D	A
Approach Delay	16.6		9.4	44.6	
Approach LOS	B		A	D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 115.2 (96%), Referenced to phase 2:EBT and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

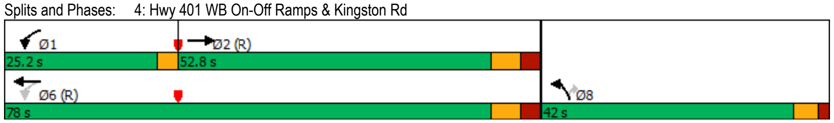
Maximum v/c Ratio: 0.77

Intersection Signal Delay: 21.8 Intersection LOS: C

Intersection Capacity Utilization 66.0% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	745	5	290	635	595	80
Future Volume (vph)	745	5	290	635	595	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	4.4	4.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3430		1801	3466	3459	1516
Flt Permitted	1.00		0.29	1.00	1.00	1.00
Satd. Flow (perm)	3430		528	3466	3459	1516
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	776	5	302	661	620	83
RTOR Reduction (vph)	0	0	0	0	0	63
Lane Group Flow (vph)	781	0	302	661	620	20
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	64.5		80.4	80.4	27.0	27.0
Effective Green, g (s)	65.5		81.4	81.4	28.0	28.0
Actuated g/C Ratio	0.55		0.68	0.68	0.23	0.23
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1872		505	2351	807	353
v/s Ratio Prot	c0.23		c0.07	0.19	c0.18	
v/s Ratio Perm			0.34			0.01
v/c Ratio	0.42		0.60	0.28	0.77	0.06
Uniform Delay, d1	16.0		8.6	7.7	43.0	35.7
Progression Factor	0.91		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		1.9	0.3	4.4	0.1
Delay (s)	15.3		10.5	8.0	47.4	35.8
Level of Service	B		B	A	D	D
Approach Delay (s)	15.3			8.8	46.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.6
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

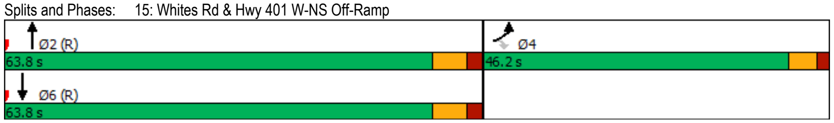
c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	600	350	855	545
Future Volume (vph)	600	350	855	545
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	30.6	30.6	68.9	68.9
Actuated g/C Ratio	0.28	0.28	0.63	0.63
v/c Ratio	0.76	0.55	0.43	0.27
Control Delay	41.0	9.9	11.9	10.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.0	9.9	11.9	10.3
LOS	D	A	B	B
Approach Delay	31.4		11.9	10.3
Approach LOS	C		B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 19.4 Intersection LOS: B
Intersection Capacity Utilization 53.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	600	350	0	855	545	0
Future Volume (vph)	600	350	0	855	545	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3355	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3355	1379		3466	3500	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	652	380	0	929	592	0
RTOR Reduction (vph)	7	193	0	0	0	0
Lane Group Flow (vph)	706	126	0	929	592	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.6	29.6		67.9	67.9	
Effective Green, g (s)	30.6	30.6		68.9	68.9	
Actuated g/C Ratio	0.28	0.28		0.63	0.63	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	933	383		2170	2192	
v/s Ratio Prot	c0.21			c0.27	0.17	
v/s Ratio Perm		0.09				
v/c Ratio	0.76	0.33		0.43	0.27	
Uniform Delay, d1	36.3	31.5		10.5	9.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.5		0.6	0.3	
Delay (s)	39.8	32.0		11.1	9.5	
Level of Service	D	C		B	A	
Approach Delay (s)	37.4			11.1	9.5	
Approach LOS	D			B	A	

Intersection Summary

HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Future Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	48	0	0	0	0	16	0	32	0	16	8	40

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	48	16	32	16	48
Volume Left (vph)	48	0	0	16	0
Volume Right (vph)	0	16	0	0	40
Hadj (s)	0.20	-0.60	0.17	0.50	-0.53
Departure Headway (s)	4.3	3.6	4.4	5.2	4.1
Degree Utilization, x	0.06	0.02	0.04	0.02	0.06
Capacity (veh/h)	810	977	799	676	846
Control Delay (s)	7.6	6.6	7.6	7.1	6.2
Approach Delay (s)	7.6	6.6	7.6	6.4	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	7.0		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	790	5	0	1205	0	0
Future Volume (Veh/h)	790	5	0	1205	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	859	5	0	1310	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.94		0.89	0.94
vC, conflicting volume			864		1514	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			733		1035	272
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			830		205	689

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	430	430	5	655	655
Volume Left	0	0	0	0	0
Volume Right	0	0	5	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.25	0.00	0.39	0.39
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

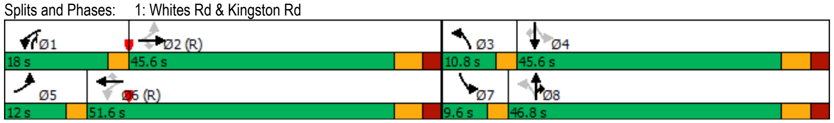
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	730	360	250	810	540	265	1095	840	170	740	160
Future Volume (vph)	170	730	360	250	810	540	265	1095	840	170	740	160
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	8.0	43.0	43.0	8.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	45.6	45.6	18.0	51.6	51.6	10.8	46.8		9.6	45.6	45.6
Total Split (%)	10.0%	38.0%	38.0%	15.0%	43.0%	43.0%	9.0%	39.0%		8.0%	38.0%	38.0%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	0.0	2.8	2.8	0.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	2.0	6.0	6.0	2.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max		None	Max	Max
Act Effct Green (s)	54.5	40.7	40.7	61.6	45.8	45.8	56.4	40.7	57.6	55.2	39.5	39.5
Actuated g/C Ratio	0.45	0.34	0.34	0.51	0.38	0.38	0.47	0.34	0.48	0.46	0.33	0.33
v/c Ratio	0.55	0.61	0.57	0.67	0.61	0.79	0.74	0.64	0.77	0.69	0.45	0.27
Control Delay	23.2	36.1	17.8	32.3	22.2	19.1	34.4	35.4	10.3	33.9	32.7	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	36.1	17.8	32.3	22.2	19.1	34.4	35.4	10.3	33.9	32.7	5.5
LOS	C	D	B	C	C	B	C	D	B	C	C	A
Approach Delay		29.1			22.7			25.7			28.8	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1.2 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 26.2 Intersection LOS: C
Intersection Capacity Utilization 106.3% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



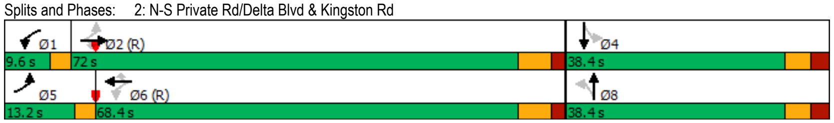
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	730	360	250	810	540	265	1095	840	170	740	160
Future Volume (vph)	170	730	360	250	810	540	265	1095	840	170	740	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	6.0	6.0	2.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1835	3535	1489	1816	3535	1497	1833	5129	1561	1818	5079	1505
Flt Permitted	0.24	1.00	1.00	0.22	1.00	1.00	0.28	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	441	3535	1489	394	3535	1497	522	5129	1561	277	5079	1505
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	172	737	364	253	818	545	268	1106	848	172	747	162
RTOR Reduction (vph)	0	0	135	0	0	117	0	0	326	0	0	109
Lane Group Flow (vph)	172	737	229	253	818	428	268	1106	522	172	747	53
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	48.5	39.7	39.7	56.6	44.8	44.8	47.5	39.7	60.7	45.1	38.5	38.5
Effective Green, g (s)	50.5	40.7	40.7	57.6	45.8	45.8	52.3	40.7	61.7	51.1	39.5	39.5
Actuated g/C Ratio	0.42	0.34	0.34	0.48	0.38	0.38	0.44	0.34	0.51	0.43	0.33	0.33
Clearance Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	299	1198	505	365	1349	571	345	1739	802	241	1671	495
v/s Ratio Prot	0.05	0.21		c0.09	0.23		c0.07	0.22	c0.33	0.06	0.15	
v/s Ratio Perm	0.20		0.15	0.25		c0.29	0.27			0.25		0.04
v/c Ratio	0.58	0.62	0.45	0.69	0.61	0.75	0.78	0.64	0.65	0.71	0.45	0.11
Uniform Delay, d1	23.1	33.1	31.0	21.0	29.8	32.1	23.4	33.4	21.3	23.5	31.7	28.0
Progression Factor	1.00	1.00	1.00	1.49	0.68	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	2.4	2.9	4.5	1.6	7.0	10.5	1.8	1.9	9.6	0.9	0.4
Delay (s)	25.7	35.5	33.9	35.7	22.0	24.1	33.9	35.2	23.2	33.1	32.5	28.4
Level of Service	C	D	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		33.7			24.8			30.5			32.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	125	1445	45	85	1335	110	175	20	105	15
Future Volume (vph)	125	1445	45	85	1335	110	175	20	105	15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	8.0	31.9	31.9	8.0	31.9	31.9	37.6	37.6	37.6	37.6
Total Split (s)	13.2	72.0	72.0	9.6	68.4	68.4	38.4	38.4	38.4	38.4
Total Split (%)	11.0%	60.0%	60.0%	8.0%	57.0%	57.0%	32.0%	32.0%	32.0%	32.0%
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.8	3.8	3.8	3.8
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	2.0	5.9	5.9	2.0	5.9	5.9	5.6	5.6		5.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	85.1	72.3	72.3	82.3	70.8	70.8	26.5	26.5		26.5
Actuated g/C Ratio	0.71	0.60	0.60	0.69	0.59	0.59	0.22	0.22		0.22
v/c Ratio	0.46	0.70	0.05	0.38	0.66	0.12	0.85	0.32		0.42
Control Delay	15.5	13.8	1.2	12.8	14.8	1.2	75.6	10.5		19.4
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	15.5	13.9	1.2	12.8	14.8	1.2	75.6	10.5		19.4
LOS	B	B	A	B	B	A	E	B		B
Approach Delay		13.7			13.7			46.6		19.4
Approach LOS		B			B			D		B

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111.6 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 87.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: N-S Private Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1445	45	85	1335	110	175	20	120	105	15	140
Future Volume (vph)	125	1445	45	85	1335	110	175	20	120	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	2.0	5.9	5.9	2.0	5.9	5.9	5.6	5.6			5.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87			0.92	
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			0.98	
Satd. Flow (prot)	1837	3535	1501	1837	3535	1493	1804	1599			3153	
Flt Permitted	0.12	1.00	1.00	0.10	1.00	1.00	0.54	1.00			0.74	
Satd. Flow (perm)	218	3535	1501	188	3535	1493	967	1599			2380	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	129	1490	46	88	1376	113	180	21	124	108	15	144
RTOR Reduction (vph)	0	0	18	0	0	36	0	97	0	0	109	0
Lane Group Flow (vph)	129	1490	28	88	1376	77	180	48	0	0	158	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	79.5	71.3	71.3	76.5	69.8	69.8	25.5	25.5			25.5	
Effective Green, g (s)	81.5	72.3	72.3	78.5	70.8	70.8	26.5	26.5			26.5	
Actuated g/C Ratio	0.68	0.60	0.60	0.65	0.59	0.59	0.22	0.22			0.22	
Clearance Time (s)	3.0	6.9	6.9	3.0	6.9	6.9	6.6	6.6			6.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	272	2129	904	228	2085	880	213	353			525	
v/s Ratio Prot	c0.04	c0.42		0.02	0.39			0.03				
v/s Ratio Perm	0.29		0.02	0.23		0.05	c0.19				0.07	
v/c Ratio	0.47	0.70	0.03	0.39	0.66	0.09	0.85	0.14			0.30	
Uniform Delay, d1	12.0	16.4	9.7	12.5	16.5	10.6	44.8	37.6			39.0	
Progression Factor	1.82	0.69	0.53	1.34	0.74	0.20	1.00	1.00			1.00	
Incremental Delay, d2	1.0	1.5	0.0	0.9	1.4	0.2	25.2	0.2			0.3	
Delay (s)	22.8	12.8	5.2	17.7	13.6	2.3	70.0	37.7			39.3	
Level of Service	C	B	A	B	B	A	E	D			D	
Approach Delay (s)		13.3			13.0			55.6			39.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: 715 & 775 Kingston Dwy/780 Kingston Dwy & Kingston Rd

Existing PM
10-29-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰		↱	↰		↱
Traffic Volume (veh/h)	50	1615	5	10	1450	45	10	0	20	20	0	70
Future Volume (Veh/h)	50	1615	5	10	1450	45	10	0	20	20	0	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	52	1682	5	10	1510	47	10	0	21	21	0	73
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		134			134							
pX, platoon unblocked	0.90			0.70			0.75	0.75	0.70	0.75	0.75	0.90
vC, conflicting volume	1562			1692			2639	3373	846	2501	3331	760
vC1, stage 1 conf vol							1791	1791		1535	1535	
vC2, stage 2 conf vol							848	1582		966	1796	
vCu, unblocked vol	1409			1134			1940	2920	0	1756	2864	522
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			98			90	100	97	84	100	84
cM capacity (veh/h)	442			435			101	91	762	130	105	455

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	52	841	841	5	10	755	755	47	10	21	21	73
Volume Left	52	0	0	0	10	0	0	0	10	0	21	0
Volume Right	0	0	0	5	0	0	0	47	0	21	0	73
cSH	442	1700	1700	1700	435	1700	1700	1700	101	762	130	455
Volume to Capacity	0.12	0.49	0.49	0.00	0.02	0.44	0.44	0.03	0.10	0.03	0.16	0.16
Queue Length 95th (m)	3.2	0.0	0.0	0.0	0.6	0.0	0.0	0.0	2.6	0.7	4.5	4.5
Control Delay (s)	14.2	0.0	0.0	0.0	13.5	0.0	0.0	0.0	44.5	9.9	38.0	14.4
Lane LOS	B				B				E	A	E	B
Approach Delay (s)	0.4				0.1				21.0		19.7	
Approach LOS									C		C	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

Timings
4: Hwy 401 WB On-Off Ramps & Kingston Rd

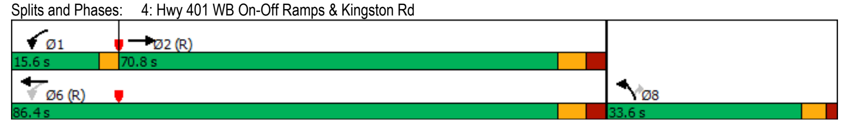
Existing PM
10-29-2024

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↱	↰	↑↑	↰↰	↱
Traffic Volume (vph)	1635	185	800	705	105
Future Volume (vph)	1635	185	800	705	105
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	70.8	15.6	86.4	33.6	33.6
Total Split (%)	59.0%	13.0%	72.0%	28.0%	28.0%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	1.0	6.2	1.9	4.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	C-Max	None	None
Act Effct Green (s)	67.1	86.5	81.3	30.6	28.1
Actuated g/C Ratio	0.56	0.72	0.68	0.26	0.23
v/c Ratio	0.87	0.75	0.35	0.82	0.26
Control Delay	14.2	45.3	8.8	50.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	45.3	8.8	50.3	13.5
LOS	B	D	A	D	B
Approach Delay	14.2		15.7	45.5	
Approach LOS	B		B	D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8.4 (7%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 22.0 Intersection LOS: C
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



HCM Signalized Intersection Capacity Analysis
4: Hwy 401 WB On-Off Ramps & Kingston Rd

Existing PM
10-29-2024

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1635	20	185	800	705	105
Future Volume (vph)	1635	20	185	800	705	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		1.0	6.2	1.9	4.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3529		1783	3535	3528	1532
Flt Permitted	1.00		0.06	1.00	1.00	1.00
Satd. Flow (perm)	3529		103	3535	3528	1532
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1703	21	193	833	734	109
RTOR Reduction (vph)	1	0	0	0	0	64
Lane Group Flow (vph)	1723	0	193	833	734	45
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	66.1		80.3	80.3	27.1	27.1
Effective Green, g (s)	67.1		82.3	81.3	30.6	28.1
Actuated g/C Ratio	0.56		0.69	0.68	0.26	0.23
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1973		255	2394	899	358
v/s Ratio Prot	c0.49		c0.08	0.24	c0.21	
v/s Ratio Perm			0.43			0.03
v/c Ratio	0.87		0.76	0.35	0.82	0.13
Uniform Delay, d1	22.8		35.2	8.2	42.1	36.3
Progression Factor	0.38		1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5		12.1	0.4	5.8	0.2
Delay (s)	13.2		47.3	8.6	47.9	36.4
Level of Service	B		D	A	D	D
Approach Delay (s)	13.2			15.9	46.4	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

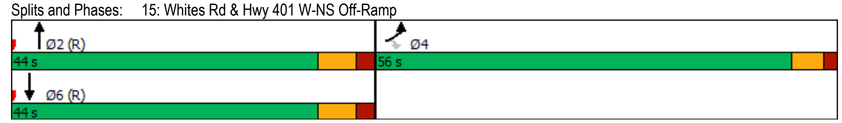
Timings
15: Whites Rd & Hwy 401 W-NS Off-Ramp

Existing PM
10-29-2024

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1585	775	950	615
Future Volume (vph)	1585	775	950	615
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	56.0	56.0	44.0	44.0
Total Split (%)	56.0%	56.0%	44.0%	44.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	53.6	51.1	38.4	38.4
Actuated g/C Ratio	0.54	0.51	0.38	0.38
v/c Ratio	0.91	0.82	0.73	0.47
Control Delay	29.6	19.7	30.3	24.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.6	19.7	30.3	24.7
LOS	C	B	C	C
Approach Delay	26.7		30.3	24.7
Approach LOS	C		C	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 27.3	Intersection LOS: C
Intersection Capacity Utilization 87.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1585	775	0	950	615	0
Future Volume (vph)	1585	775	0	950	615	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3536	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3536	1407		3535	3535	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1651	807	0	990	641	0
RTOR Reduction (vph)	4	165	0	0	0	0
Lane Group Flow (vph)	1728	561	0	990	641	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	50.1	50.1		37.4	37.4	
Effective Green, g (s)	53.6	51.1		38.4	38.4	
Actuated g/C Ratio	0.54	0.51		0.38	0.38	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1895	718		1357	1357	
v/s Ratio Prot	c0.49			c0.28	0.18	
v/s Ratio Perm		0.40				
v/c Ratio	0.91	0.78		0.73	0.47	
Uniform Delay, d1	21.1	19.9		26.4	23.2	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.1	5.5		3.5	1.2	
Delay (s)	28.2	25.4		29.8	24.4	
Level of Service	C	C		C	C	
Approach Delay (s)	27.4			29.8	24.4	
Approach LOS	C			C	C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Future Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	142	0	0	0	0	34	0	182	0	11	45	108

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	142	34	182	11	153
Volume Left (vph)	142	0	0	11	0
Volume Right (vph)	0	34	0	0	108
Hadj (s)	0.20	-0.55	0.02	0.50	-0.47
Departure Headway (s)	4.9	4.4	4.7	5.6	4.6
Degree Utilization, x	0.20	0.04	0.24	0.02	0.20
Capacity (veh/h)	677	744	739	610	739
Control Delay (s)	9.1	7.6	9.1	7.5	7.6
Approach Delay (s)	9.1	7.6	9.1	7.6	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		
Traffic Volume (veh/h)	1615	125	0	1615	0	0
Future Volume (Veh/h)	1615	125	0	1615	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1755	136	0	1755	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.83		0.81	0.83
vC, conflicting volume			1891		2632	878
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1665		1614	446
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			325		79	470

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2
Volume Total	878	878	136	878	878
Volume Left	0	0	0	0	0
Volume Right	0	0	136	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.52	0.08	0.52	0.52
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

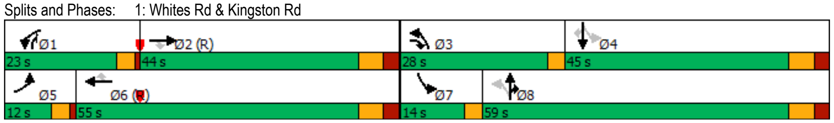
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

2029 Future Background Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	325	670	145	840	360	235	460	415	145	1150	125
Future Volume (vph)	105	325	670	145	840	360	235	460	415	145	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	11.8	42.3	72.3	16.7	47.3	47.3	71.5	52.3	72.0	53.5	37.9	37.9
Actuated g/C Ratio	0.08	0.30	0.52	0.12	0.34	0.34	0.51	0.37	0.51	0.38	0.27	0.27
v/c Ratio	0.70	0.32	0.81	0.67	0.73	0.51	0.57	0.25	0.46	0.36	0.85	0.25
Control Delay	86.4	40.0	33.2	62.1	34.9	9.8	33.6	30.6	7.6	22.6	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	40.0	33.2	62.1	34.9	9.8	33.6	30.6	7.6	22.6	55.0	5.6
LOS	F	D	C	E	C	A	C	C	A	C	D	A
Approach Delay		40.3			31.1			22.6			47.3	
Approach LOS		D			C			C			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



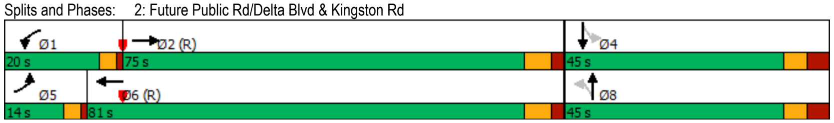
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	325	670	145	840	360	235	460	415	145	1150	125
Future Volume (vph)	105	325	670	145	840	360	235	460	415	145	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	325	670	145	840	360	235	460	415	145	1150	125
RTOR Reduction (vph)	0	0	48	0	0	219	0	0	129	0	0	91
Lane Group Flow (vph)	105	325	622	145	840	141	235	460	286	145	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	10.8	41.3	66.3	15.7	46.2	46.2	64.9	51.3	74.1	47.5	36.9	36.9
Effective Green, g (s)	11.8	42.3	68.3	16.7	47.2	47.2	67.4	52.3	75.1	49.5	37.9	37.9
Actuated g/C Ratio	0.08	0.30	0.49	0.12	0.34	0.34	0.48	0.37	0.54	0.35	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	150	1027	738	216	1157	493	408	1842	797	376	1361	400
v/s Ratio Prot	c0.06	0.10	c0.16	c0.08	0.24		0.11	0.09	0.19	0.03	c0.23	
v/s Ratio Perm			0.25			0.10	0.16			0.10		0.02
v/c Ratio	0.70	0.32	0.84	0.67	0.73	0.29	0.58	0.25	0.36	0.39	0.84	0.08
Uniform Delay, d1	62.4	37.7	31.2	59.0	40.7	34.0	31.1	30.3	18.6	31.9	48.3	38.1
Progression Factor	1.00	1.00	1.00	0.83	0.76	1.52	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.4	0.8	8.7	7.0	3.5	1.3	2.0	0.1	0.3	0.7	5.0	0.1
Delay (s)	75.7	38.5	39.8	56.0	34.5	53.2	33.1	30.4	18.9	32.5	53.3	38.2
Level of Service	E	D	D	E	C	D	C	C	B	C	D	D
Approach Delay (s)		42.9			41.8			26.7			49.8	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	775	55	1225	40	0	60	10
Future Volume (vph)	95	775	55	1225	40	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	13.7	102.8	11.1	98.2	12.2	12.2		12.2
Actuated g/C Ratio	0.10	0.73	0.08	0.70	0.09	0.09		0.09
v/c Ratio	0.53	0.31	0.43	0.55	0.48	0.05		0.57
Control Delay	63.8	6.9	81.3	13.0	78.8	0.2		27.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0		0.0
Total Delay	63.8	6.9	81.3	13.2	78.8	0.2		27.8
LOS	E	A	F	B	E	A		C
Approach Delay		13.0		15.9		52.6		27.8
Approach LOS		B		B		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 83.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	775	10	55	1225	105	40	0	20	60	10	135
Future Volume (vph)	95	775	10	55	1225	105	40	0	20	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3395		1611	3424		1709	1426			3129	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.86	
Satd. Flow (perm)	1837	3395		1611	3424		965	1426			2735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	775	10	55	1225	105	40	0	20	60	10	135
RTOR Reduction (vph)	0	0	0	0	3	0	0	18	0	0	123	0
Lane Group Flow (vph)	95	785	0	55	1327	0	40	2	0	0	82	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.7	101.0		8.9	97.2		11.2	11.2			11.2	
Effective Green, g (s)	13.7	102.0		9.9	98.2		12.2	12.2			12.2	
Actuated g/C Ratio	0.10	0.73		0.07	0.70		0.09	0.09			0.09	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	179	2473		113	2401		84	124			238	
v/s Ratio Prot	c0.05	0.23		0.03	c0.39			0.00				
v/s Ratio Perm							c0.04				0.03	
v/c Ratio	0.53	0.32		0.49	0.55		0.48	0.01			0.34	
Uniform Delay, d1	60.1	6.7		62.6	10.2		60.9	58.4			60.1	
Progression Factor	0.91	0.89		1.19	1.10		1.00	1.00			1.00	
Incremental Delay, d2	2.8	0.3		2.9	0.8		4.2	0.0			0.9	
Delay (s)	57.3	6.3		77.4	12.0		65.1	58.4			61.0	
Level of Service	E	A		E	B		E	E			E	
Approach Delay (s)		11.8			14.6			62.9			61.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	865	25	0	1330	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	865	25	0	1330	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	865	25	0	1330	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.91			0.92			0.95	0.95	0.92	0.95	0.95	0.91
vC, conflicting volume	1400			890			1598	2278	445	1810	2258	702
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1247			713			1159	1874	230	1383	1853	483
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	89
cM capacity (veh/h)	484			827			129	69	718	98	71	479

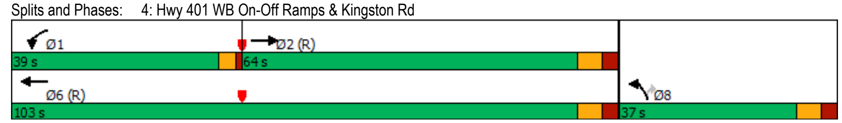
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	577	313	887	508	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	718	479
Volume to Capacity	0.34	0.18	0.52	0.30	0.01	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.1
Control Delay (s)	0.0	0.0	0.0	0.0	10.1	13.5
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.1	13.5
Approach LOS					B	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	870	355	775	620	95
Future Volume (vph)	870	355	775	620	95
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	61.2	32.4	96.6	31.2	31.2
Actuated g/C Ratio	0.44	0.23	0.69	0.22	0.22
v/c Ratio	0.58	0.85	0.32	0.81	0.24
Control Delay	25.5	70.4	9.5	59.9	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	70.4	9.5	59.9	15.4
LOS	C	E	A	E	B
Approach Delay	25.5		28.6	54.0	
Approach LOS	C		C	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 75.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	870	5	355	775	620	95
Future Volume (vph)	870	5	355	775	620	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3430		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3430		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	870	5	355	775	620	95
RTOR Reduction (vph)	0	0	0	0	0	55
Lane Group Flow (vph)	875	0	355	775	620	40
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	60.2		31.4	95.6	30.2	30.2
Effective Green, g (s)	61.2		32.4	96.6	31.2	31.2
Actuated g/C Ratio	0.44		0.23	0.69	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1499		416	2391	770	337
v/s Ratio Prot	c0.26		c0.20	0.22	c0.18	
v/s Ratio Perm						0.03
v/c Ratio	0.58		0.85	0.32	0.81	0.12
Uniform Delay, d1	29.8		51.5	8.7	51.5	43.4
Progression Factor	0.75		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6		15.5	0.4	6.1	0.2
Delay (s)	24.0		67.0	9.0	57.7	43.6
Level of Service	C		E	A	E	D
Approach Delay (s)	24.0			27.2	55.8	
Approach LOS	C			C	E	

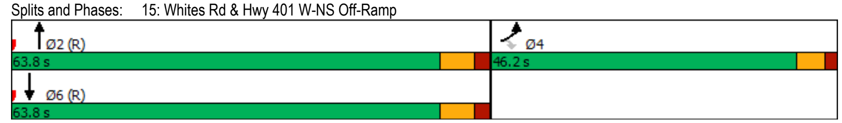
Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	635	355	945	635
Future Volume (vph)	635	355	945	635
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	29.4	29.4	70.1	70.1
Actuated g/C Ratio	0.27	0.27	0.64	0.64
v/c Ratio	0.75	0.55	0.43	0.28
Control Delay	41.7	9.6	11.4	9.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.7	9.6	11.4	9.9
LOS	D	A	B	A
Approach Delay	31.7		11.4	9.9
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 56.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	635	355	0	945	635	0
Future Volume (vph)	635	355	0	945	635	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3363	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3363	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	635	355	0	945	635	0
RTOR Reduction (vph)	6	196	0	0	0	0
Lane Group Flow (vph)	675	113	0	945	635	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	28.4	28.4		69.1	69.1	
Effective Green, g (s)	29.4	29.4		70.1	70.1	
Actuated g/C Ratio	0.27	0.27		0.64	0.64	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	898	368		2208	2230	
v/s Ratio Prot	c0.20			c0.27	0.18	
v/s Ratio Perm		0.08				
v/c Ratio	0.75	0.31		0.43	0.28	
Uniform Delay, d1	37.0	32.2		10.0	8.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	0.5		0.6	0.3	
Delay (s)	40.5	32.6		10.6	9.2	
Level of Service	D	C		B	A	
Approach Delay (s)	38.1			10.6	9.2	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Future Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	0	0	0	10	0	20	0	10	5	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	30	10	20	10	30
Volume Left (vph)	30	0	0	10	0
Volume Right (vph)	0	10	0	0	25
Hadj (s)	0.20	-0.60	0.17	0.50	-0.53
Departure Headway (s)	4.2	3.5	4.3	5.1	4.1
Degree Utilization, x	0.04	0.01	0.02	0.01	0.03
Capacity (veh/h)	832	1015	818	697	863
Control Delay (s)	7.4	6.5	7.4	7.0	6.0
Approach Delay (s)	7.4	6.5	7.4	6.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	6.9		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	5	0	1335	0	0
Future Volume (Veh/h)	880	5	0	1335	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	880	5	0	1335	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.93		0.85	0.93
vC, conflicting volume			885		1550	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			729		931	253
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			823		229	700

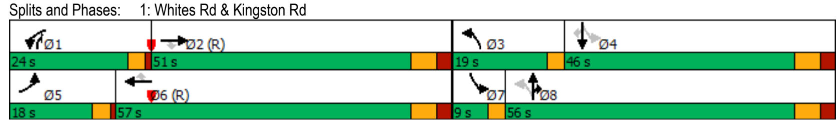
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	587	298	668	668
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.35	0.18	0.39	0.39
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	800	520	125	960	540	375	1100	905	180	750	190
Future Volume (vph)	185	800	520	125	960	540	375	1100	905	180	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	17.0	52.3	52.3	16.6	51.9	51.9	62.1	44.6	64.2	51.6	34.1	34.1
Actuated g/C Ratio	0.12	0.37	0.37	0.12	0.37	0.37	0.44	0.32	0.46	0.37	0.24	0.24
v/c Ratio	0.83	0.61	0.70	0.58	0.73	0.85	0.92	0.67	0.84	0.76	0.61	0.38
Control Delay	88.9	39.2	20.9	78.8	35.8	35.4	58.6	43.2	15.0	47.8	48.6	8.5
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0	0.0
Total Delay	88.9	40.2	20.9	78.8	35.8	36.0	58.6	43.2	15.8	47.8	48.6	8.5
LOS	F	D	C	E	D	D	E	D	B	D	D	A
Approach Delay		39.5			39.1			35.2			41.6	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 38.2	Intersection LOS: D
Intersection Capacity Utilization 110.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



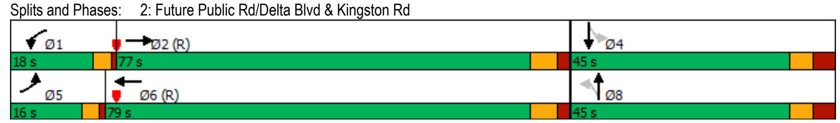
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	800	520	125	960	540	375	1100	905	180	750	190
Future Volume (vph)	185	800	520	125	960	540	375	1100	905	180	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.23	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	417	5129	1561	313	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	800	520	125	960	540	375	1100	905	180	750	190
RTOR Reduction (vph)	0	0	194	0	0	84	0	0	348	0	0	136
Lane Group Flow (vph)	185	800	326	125	960	456	375	1100	557	180	750	54
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	16.0	51.3	51.3	15.6	50.9	50.9	55.0	43.6	66.3	41.5	33.1	33.1
Effective Green, g (s)	17.0	52.3	52.3	16.6	51.9	51.9	58.0	44.6	67.3	47.5	34.1	34.1
Actuated g/C Ratio	0.12	0.37	0.37	0.12	0.37	0.37	0.41	0.32	0.48	0.34	0.24	0.24
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	223	1320	554	215	1310	553	394	1633	750	228	1237	365
v/s Ratio Prot	0.10	0.23		0.07	0.27		c0.15	0.21	c0.36	0.06	0.15	
v/s Ratio Perm			0.22			c0.31	0.24			0.20		0.04
v/c Ratio	0.83	0.61	0.59	0.58	0.73	0.83	0.95	0.67	0.74	0.79	0.61	0.15
Uniform Delay, d1	60.1	35.5	35.2	58.4	38.1	39.9	31.6	41.4	29.3	34.6	47.0	41.5
Progression Factor	1.00	1.00	1.00	1.23	0.85	0.81	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.8	2.1	4.5	2.8	2.6	9.7	32.9	1.1	4.0	16.4	0.8	0.2
Delay (s)	81.9	37.6	39.7	74.5	35.1	42.1	64.5	42.5	33.3	51.1	47.8	41.7
Level of Service	F	D	D	E	D	D	E	D	C	D	D	D
Approach Delay (s)		43.8			40.5			42.5			47.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1590	115	1365	175	20	105	15
Future Volume (vph)	125	1590	115	1365	175	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	14.1	80.7	14.0	80.6	29.4	29.4		29.4
Actuated g/C Ratio	0.10	0.58	0.10	0.58	0.21	0.21		0.21
v/c Ratio	0.68	0.81	0.63	0.73	0.85	0.33		0.42
Control Delay	79.4	22.9	73.1	26.6	84.5	11.8		22.3
Queue Delay	0.0	0.8	0.0	0.3	0.0	0.0		0.0
Total Delay	79.4	23.7	73.1	26.8	84.5	11.8		22.3
LOS	E	C	E	C	F	B		C
Approach Delay		27.7		30.2		52.1		22.3
Approach LOS		C		C		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 30.3	Intersection LOS: C
Intersection Capacity Utilization 99.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1590	45	115	1365	110	175	20	120	105	15	140
Future Volume (vph)	125	1590	45	115	1365	110	175	20	120	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.87			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3517		1837	3485		1805	1599			3154	
Flt Permitted	1.00	1.00		1.00	1.00		0.55	1.00			0.75	
Satd. Flow (perm)	1837	3517		1837	3485		990	1599			2405	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1590	45	115	1365	110	175	20	120	105	15	140
RTOR Reduction (vph)	0	1	0	0	4	0	0	95	0	0	111	0
Lane Group Flow (vph)	125	1634	0	115	1471	0	175	45	0	0	149	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.1	79.7		13.0	79.6		28.4	28.4			28.4	
Effective Green, g (s)	14.1	80.7		14.0	80.6		29.4	29.4			29.4	
Actuated g/C Ratio	0.10	0.58		0.10	0.58		0.21	0.21			0.21	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	185	2027		183	2006		207	335			505	
v/s Ratio Prot	c0.07	c0.46		0.06	0.42			0.03				
v/s Ratio Perm							c0.18				0.06	
v/c Ratio	0.68	0.81		0.63	0.73		0.85	0.13			0.30	
Uniform Delay, d1	60.7	23.5		60.5	21.8		53.1	45.0			46.6	
Progression Factor	1.11	0.79		0.99	1.04		1.00	1.00			1.00	
Incremental Delay, d2	6.4	2.4		5.6	2.0		25.8	0.2			0.3	
Delay (s)	73.6	21.0		65.7	24.8		78.9	45.1			46.9	
Level of Service	E	C		E	C		E	D			D	
Approach Delay (s)		24.7			27.8			63.9			46.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1830	15	0	1500	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1830	15	0	1500	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1830	15	0	1500	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.90			0.62			0.67	0.67	0.62	0.67	0.67	0.90
vC, conflicting volume	1600			1850			2682	3442	928	2498	3402	802
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1444			1142			1852	2988	0	1575	2928	558
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	79
cM capacity (veh/h)	426			382			25	9	673	48	10	429

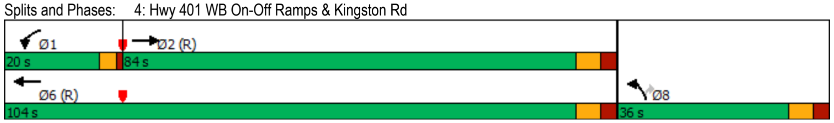
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1220	625	1000	595	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	673	429
Volume to Capacity	0.72	0.37	0.59	0.35	0.04	0.21
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1	6.3
Control Delay (s)	0.0	0.0	0.0	0.0	10.6	15.6
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		10.6	15.6
Approach LOS					B	C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1840	225	885	710	185
Future Volume (vph)	1840	225	885	710	185
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.1	19.1	98.2	32.1	29.6
Actuated g/C Ratio	0.55	0.14	0.70	0.23	0.21
v/c Ratio	0.96	0.93	0.36	0.88	0.44
Control Delay	25.1	100.7	8.8	65.1	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	100.7	8.9	65.1	21.0
LOS	C	F	A	E	C
Approach Delay	25.1		27.5	56.0	
Approach LOS	C		C	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 96.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



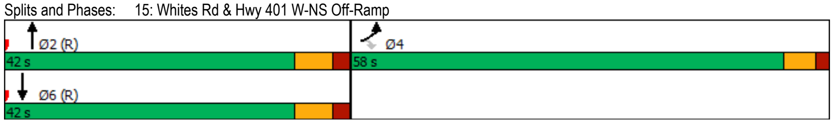
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1840	20	225	885	710	185
Future Volume (vph)	1840	20	225	885	710	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3529		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3529		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1840	20	225	885	710	185
RTOR Reduction (vph)	0	0	0	0	0	95
Lane Group Flow (vph)	1860	0	225	885	710	90
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.1		17.1	97.2	28.6	28.6
Effective Green, g (s)	77.1		19.1	98.2	32.1	29.6
Actuated g/C Ratio	0.55		0.14	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1943		243	2479	808	323
v/s Ratio Prot	c0.53		c0.13	0.25	c0.20	
v/s Ratio Perm						0.06
v/c Ratio	0.96		0.93	0.36	0.88	0.28
Uniform Delay, d1	29.9		59.8	8.3	52.1	46.3
Progression Factor	0.50		1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4		37.8	0.4	10.7	0.5
Delay (s)	24.3		97.6	8.7	62.8	46.7
Level of Service	C		F	A	E	D
Approach Delay (s)	24.3			26.7	59.4	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1655	795	1070	675
Future Volume (vph)	1655	795	1070	675
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.4	52.9	36.6	36.6
Actuated g/C Ratio	0.55	0.53	0.37	0.37
v/c Ratio	0.88	0.79	0.83	0.52
Control Delay	26.2	17.2	35.6	26.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.2	17.2	35.6	26.8
LOS	C	B	D	C
Approach Delay	23.6		35.6	26.8
Approach LOS	C		D	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 27.2	Intersection LOS: C
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1655	795	0	1070	675	0
Future Volume (vph)	1655	795	0	1070	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3537	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3537	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1655	795	0	1070	675	0
RTOR Reduction (vph)	4	159	0	0	0	0
Lane Group Flow (vph)	1731	556	0	1070	675	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	51.9	51.9		35.6	35.6	
Effective Green, g (s)	55.4	52.9		36.6	36.6	
Actuated g/C Ratio	0.55	0.53		0.37	0.37	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1959	744		1293	1293	
v/s Ratio Prot	c0.49			c0.30	0.19	
v/s Ratio Perm		0.40				
v/c Ratio	0.88	0.75		0.83	0.52	
Uniform Delay, d1	19.5	18.3		28.8	24.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	4.1		6.2	1.5	
Delay (s)	24.6	22.4		35.0	26.4	
Level of Service	C	C		D	C	
Approach Delay (s)	24.0			35.0	26.4	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Future Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	125	0	0	0	0	30	0	160	0	10	40	95

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	125	30	160	10	135
Volume Left (vph)	125	0	0	10	0
Volume Right (vph)	0	30	0	0	95
Hadj (s)	0.20	-0.55	0.02	0.50	-0.47
Departure Headway (s)	4.8	4.2	4.6	5.5	4.6
Degree Utilization, x	0.17	0.04	0.20	0.02	0.17
Capacity (veh/h)	694	775	755	622	756
Control Delay (s)	8.8	7.4	8.7	7.4	7.3
Approach Delay (s)	8.8	7.4	8.7	7.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1760	125	0	1645	0	0
Future Volume (Veh/h)	1760	125	0	1645	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1760	125	0	1645	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.82		0.78	0.82
vC, conflicting volume			1885		2645	942
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1635		1489	481
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			328		91	438

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1173	712	822	822
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.69	0.42	0.48	0.48
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

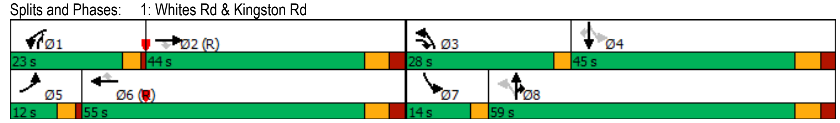
2029 Future Total Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	335	670	195	890	410	235	460	440	165	1150	125
Future Volume (vph)	105	335	670	195	890	410	235	460	440	165	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	11.5	40.0	70.0	19.1	47.6	47.6	71.4	51.7	73.8	54.0	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.50	0.14	0.34	0.34	0.51	0.37	0.53	0.39	0.27	0.27
v/c Ratio	0.72	0.35	0.83	0.79	0.76	0.57	0.57	0.25	0.49	0.41	0.85	0.25
Control Delay	88.9	41.7	36.1	88.4	37.5	11.1	33.7	30.9	9.5	23.3	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.9	41.7	36.1	88.4	37.5	11.1	33.7	30.9	9.5	23.3	55.0	5.6
LOS	F	D	D	F	D	B	C	C	A	C	D	A
Approach Delay		42.8			36.9			23.2			47.1	
Approach LOS		D			D			C			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 38.0 Intersection LOS: D
Intersection Capacity Utilization 95.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	335	670	195	890	410	235	460	440	165	1150	125
Future Volume (vph)	105	335	670	195	890	410	235	460	440	165	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	335	670	195	890	410	235	460	440	165	1150	125
RTOR Reduction (vph)	0	0	50	0	0	218	0	0	116	0	0	91
Lane Group Flow (vph)	105	335	620	195	890	192	235	460	324	165	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	10.5	38.9	63.9	18.1	46.5	46.5	64.9	50.8	76.0	48.0	36.9	36.9
Effective Green, g (s)	11.5	39.9	65.9	19.1	47.5	47.5	67.4	51.8	77.0	50.0	37.9	37.9
Actuated g/C Ratio	0.08	0.28	0.47	0.14	0.34	0.34	0.48	0.37	0.55	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	146	969	712	248	1164	496	408	1824	817	382	1361	400
v/s Ratio Prot	0.06	0.10	c0.16	c0.11	0.26		0.11	0.09	0.22	0.04	c0.23	
v/s Ratio Perm			0.25			0.13	0.16			0.12		0.02
v/c Ratio	0.72	0.35	0.87	0.79	0.76	0.39	0.58	0.25	0.40	0.43	0.84	0.08
Uniform Delay, d1	62.7	39.7	33.2	58.5	41.3	35.2	31.1	30.6	18.1	31.9	48.3	38.1
Progression Factor	1.00	1.00	1.00	1.21	0.81	1.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	1.0	11.3	12.1	3.8	1.8	2.0	0.1	0.3	0.8	5.0	0.1
Delay (s)	78.2	40.7	44.6	83.0	37.2	40.2	33.1	30.7	18.4	32.7	53.3	38.2
Level of Service	E	D	D	F	D	D	C	C	B	C	D	D
Approach Delay (s)		46.6			44.0			26.4			49.6	
Approach LOS		D			D			C			D	

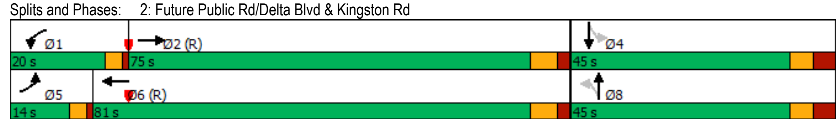
Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	770	100	1225	190	0	60	10
Future Volume (vph)	95	770	100	1225	190	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	12.3	79.4	14.3	81.4	30.4	30.4		30.4
Actuated g/C Ratio	0.09	0.57	0.10	0.58	0.22	0.22		0.22
v/c Ratio	0.59	0.44	0.61	0.67	0.82	0.36		0.34
Control Delay	74.9	18.9	65.8	29.6	78.4	1.9		16.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0		0.0
Total Delay	74.9	18.9	65.8	29.7	78.4	1.9		16.5
LOS	E	B	E	C	E	A		B
Approach Delay		24.5		32.3		40.1		16.5
Approach LOS		C		C		D		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 88.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	770	70	100	1225	105	190	0	190	60	10	135
Future Volume (vph)	95	770	70	100	1225	105	190	0	190	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3371		1611	3424		1709	1426			3131	
Flt Permitted	1.00	1.00		1.00	1.00		0.62	1.00			0.72	
Satd. Flow (perm)	1837	3371		1611	3424		1065	1426			2285	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	770	70	100	1225	105	190	0	190	60	10	135
RTOR Reduction (vph)	0	4	0	0	4	0	0	149	0	0	106	0
Lane Group Flow (vph)	95	836	0	100	1326	0	190	41	0	0	99	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	11.3	78.4		13.3	80.4		29.4	29.4			29.4	
Effective Green, g (s)	12.3	79.4		14.3	81.4		30.4	30.4			30.4	
Actuated g/C Ratio	0.09	0.57		0.10	0.58		0.22	0.22			0.22	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	161	1911		164	1990		231	309			496	
v/s Ratio Prot	0.05	0.25		c0.06	c0.39			0.03				
v/s Ratio Perm							c0.18				0.04	
v/c Ratio	0.59	0.44		0.61	0.67		0.82	0.13			0.20	
Uniform Delay, d1	61.4	17.4		60.2	20.0		52.2	44.2			44.9	
Progression Factor	1.00	0.96		0.87	1.30		1.00	1.00			1.00	
Incremental Delay, d2	5.3	0.7		5.5	1.6		20.5	0.2			0.2	
Delay (s)	66.4	17.4		57.9	27.5		72.7	44.4			45.1	
Level of Service	E	B		E	C		E	D			D	
Approach Delay (s)		22.4			29.7			58.5			45.1	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1030	25	0	1375	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	1030	25	0	1375	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1030	25	0	1375	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.91			0.86			0.91	0.91	0.86	0.91	0.91	0.91
vC, conflicting volume	1445			1055			1785	2488	528	1938	2468	725
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1289			751			1215	1986	142	1382	1964	497
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	88
cM capacity (veh/h)	464			750			112	56	767	94	58	467

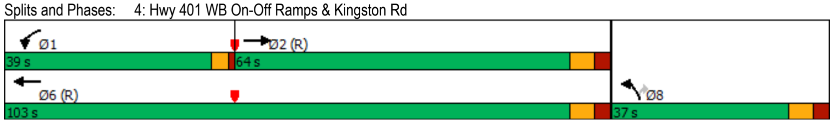
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	687	368	917	523	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	767	467
Volume to Capacity	0.40	0.22	0.54	0.31	0.01	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.2
Control Delay (s)	0.0	0.0	0.0	0.0	9.8	13.7
Lane LOS					A	B
Approach Delay (s)	0.0		0.0		9.8	13.7
Approach LOS					A	B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	990	355	810	630	95
Future Volume (vph)	990	355	810	630	95
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	62.2	32.2	97.4	30.4	30.4
Actuated g/C Ratio	0.44	0.23	0.70	0.22	0.22
v/c Ratio	0.68	0.86	0.34	0.84	0.25
Control Delay	18.1	71.6	9.1	63.3	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	71.6	9.1	63.3	16.5
LOS	B	E	A	E	B
Approach Delay	18.1		28.2	57.1	
Approach LOS	B		C	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 80.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	990	50	355	810	630	95
Future Volume (vph)	990	50	355	810	630	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3414		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3414		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	990	50	355	810	630	95
RTOR Reduction (vph)	2	0	0	0	0	55
Lane Group Flow (vph)	1038	0	355	810	630	40
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	61.2		31.2	96.4	29.4	29.4
Effective Green, g (s)	62.2		32.2	97.4	30.4	30.4
Actuated g/C Ratio	0.44		0.23	0.70	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1516		414	2411	751	329
v/s Ratio Prot	c0.30		c0.20	0.23	c0.18	
v/s Ratio Perm						0.03
v/c Ratio	0.68		0.86	0.34	0.84	0.12
Uniform Delay, d1	31.1		51.7	8.5	52.5	44.1
Progression Factor	0.48		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4		15.9	0.4	8.2	0.2
Delay (s)	17.4		67.6	8.8	60.6	44.2
Level of Service	B		E	A	E	D
Approach Delay (s)	17.4			26.8	58.5	
Approach LOS	B			C	E	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

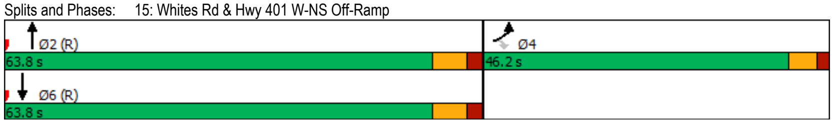
c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	655	355	950	630
Future Volume (vph)	655	355	950	630
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	30.1	30.1	69.4	69.4
Actuated g/C Ratio	0.27	0.27	0.63	0.63
v/c Ratio	0.75	0.55	0.43	0.29
Control Delay	41.3	9.6	11.8	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.3	9.6	11.8	10.2
LOS	D	A	B	B
Approach Delay	31.5		11.8	10.2
Approach LOS	C		B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.1 Intersection LOS: B
Intersection Capacity Utilization 57.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	655	355	0	950	630	0
Future Volume (vph)	655	355	0	950	630	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3366	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3366	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	655	355	0	950	630	0
RTOR Reduction (vph)	5	195	0	0	0	0
Lane Group Flow (vph)	693	117	0	950	630	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.1	29.1		68.4	68.4	
Effective Green, g (s)	30.1	30.1		69.4	69.4	
Actuated g/C Ratio	0.27	0.27		0.63	0.63	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	921	377		2186	2208	
v/s Ratio Prot	c0.21			c0.27	0.18	
v/s Ratio Perm		0.09				
v/c Ratio	0.75	0.31		0.43	0.29	
Uniform Delay, d1	36.5	31.7		10.3	9.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.5		0.6	0.3	
Delay (s)	40.1	32.2		11.0	9.5	
Level of Service	D	C		B	A	
Approach Delay (s)	37.6			11.0	9.5	
Approach LOS	D			B	A	

Intersection Summary

HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: Future Public Rd & Site Dwy/715 & 775 Kingston Dwy

Future Total 2029 AM
10-29-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	0	0	0	0	10	0	20	0	10	5	130
Future Volume (Veh/h)	350	0	0	0	0	10	0	20	0	10	5	130
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	350	0	0	0	0	10	0	20	0	10	5	130
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	120	110	70	45	175	20	135			20		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120	110	70	45	175	20	135			20		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	100	100	100	100	99	100			99		
cM capacity (veh/h)	848	779	998	957	718	1064	1462			1609		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	350	10	20	10	135
Volume Left	350	0	0	10	0
Volume Right	0	10	0	0	130
cSH	848	1064	1462	1609	1700
Volume to Capacity	0.41	0.01	0.00	0.01	0.08
Queue Length 95th (m)	16.3	0.2	0.0	0.2	0.0
Control Delay (s)	12.2	8.4	0.0	7.3	0.0
Lane LOS	B	A		A	
Approach Delay (s)	12.2	8.4	0.0	0.5	
Approach LOS	B	A			

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: Kingston Rd

Future Total 2029 AM
10-29-2024

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	935	5	0	1485	0	0
Future Volume (Veh/h)	935	5	0	1485	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	935	5	0	1485	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.93		0.78	0.93
vC, conflicting volume			940		1680	470
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			777		874	270
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			786		227	680

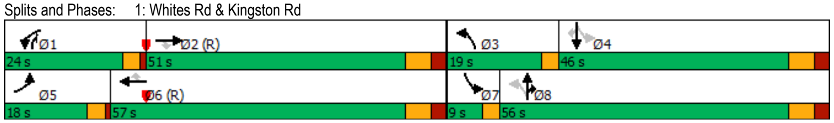
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	623	317	742	742
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.37	0.19	0.44	0.44
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	815	520	140	975	565	375	1100	975	210	750	190
Future Volume (vph)	185	815	520	140	975	565	375	1100	975	210	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	16.6	50.2	50.2	17.5	51.1	51.1	63.3	45.9	66.4	53.5	36.2	36.2
Actuated g/C Ratio	0.12	0.36	0.36	0.12	0.36	0.36	0.45	0.33	0.47	0.38	0.26	0.26
v/c Ratio	0.85	0.64	0.72	0.62	0.76	0.90	0.92	0.65	0.89	0.87	0.57	0.37
Control Delay	92.5	41.3	23.1	72.5	42.5	45.2	58.0	41.9	20.5	62.0	46.6	8.3
Queue Delay	0.0	27.3	0.0	0.0	0.0	0.6	0.0	0.0	4.6	0.0	0.0	0.0
Total Delay	92.5	68.6	23.1	72.5	42.5	45.8	58.0	41.9	25.1	62.0	46.6	8.3
LOS	F	E	C	E	D	D	E	D	C	E	D	A
Approach Delay		55.9			46.1			37.7			43.1	
Approach LOS		E			D			D			D	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 44.8 Intersection LOS: D
Intersection Capacity Utilization 116.9% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



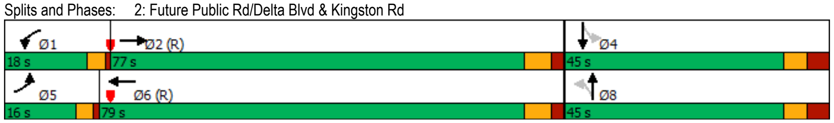
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	815	520	140	975	565	375	1100	975	210	750	190
Future Volume (vph)	185	815	520	140	975	565	375	1100	975	210	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.24	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	437	5129	1561	316	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	815	520	140	975	565	375	1100	975	210	750	190
RTOR Reduction (vph)	0	0	192	0	0	84	0	0	338	0	0	133
Lane Group Flow (vph)	185	815	328	140	975	481	375	1100	637	210	750	57
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	15.6	49.2	49.2	16.5	50.1	50.1	56.2	44.9	68.5	43.5	35.2	35.2
Effective Green, g (s)	16.6	50.2	50.2	17.5	51.1	51.1	59.2	45.9	69.5	49.5	36.2	36.2
Actuated g/C Ratio	0.12	0.36	0.36	0.12	0.37	0.37	0.42	0.33	0.50	0.35	0.26	0.26
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	217	1267	531	227	1290	544	394	1681	774	232	1313	387
v/s Ratio Prot	0.10	0.23		0.08	0.28		c0.14	0.21	c0.41	0.07	0.15	
v/s Ratio Perm			0.22			c0.32	0.26			0.25		0.04
v/c Ratio	0.85	0.64	0.62	0.62	0.76	0.88	0.95	0.65	0.82	0.91	0.57	0.15
Uniform Delay, d1	60.5	37.4	37.0	58.1	39.0	41.7	30.6	40.3	30.0	34.6	45.1	40.0
Progression Factor	1.00	1.00	1.00	1.12	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.1	2.5	5.3	3.2	2.7	12.9	32.9	0.9	7.1	34.4	0.6	0.2
Delay (s)	86.6	40.0	42.3	68.4	42.0	54.6	63.6	41.2	37.1	69.0	45.8	40.2
Level of Service	F	D	D	E	D	D	E	D	D	E	D	D
Approach Delay (s)		46.4			48.4			43.0			49.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	116.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1590	205	1365	230	20	105	15
Future Volume (vph)	125	1590	205	1365	230	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	12.8	71.6	17.7	76.5	34.8	34.8		34.8
Actuated g/C Ratio	0.09	0.51	0.13	0.55	0.25	0.25		0.25
v/c Ratio	0.74	0.98	0.88	0.77	0.91	0.41		0.40
Control Delay	86.2	42.1	87.6	32.2	88.7	12.3		20.8
Queue Delay	0.0	33.8	0.0	0.3	0.0	0.0		0.0
Total Delay	86.2	75.9	87.6	32.5	88.7	12.3		20.8
LOS	F	E	F	C	F	B		C
Approach Delay		76.5		39.2		51.8		20.8
Approach LOS		E		D		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 55.8	Intersection LOS: E
Intersection Capacity Utilization 111.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1590	160	205	1365	110	230	20	195	105	15	140
Future Volume (vph)	125	1590	160	205	1365	110	230	20	195	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3476		1837	3485		1804	1589			3155	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.68	
Satd. Flow (perm)	1837	3476		1837	3485		1016	1589			2173	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1590	160	205	1365	110	230	20	195	105	15	140
RTOR Reduction (vph)	0	5	0	0	4	0	0	129	0	0	105	0
Lane Group Flow (vph)	125	1745	0	205	1471	0	230	86	0	0	155	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	11.8	70.6		16.7	75.5		33.8	33.8			33.8	
Effective Green, g (s)	12.8	71.6		17.7	76.5		34.8	34.8			34.8	
Actuated g/C Ratio	0.09	0.51		0.13	0.55		0.25	0.25			0.25	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	167	1777		232	1904		252	394			540	
v/s Ratio Prot	0.07	c0.50		c0.11	0.42			0.05				
v/s Ratio Perm							c0.23				0.07	
v/c Ratio	0.75	0.98		0.88	0.77		0.91	0.22			0.29	
Uniform Delay, d1	62.0	33.6		60.1	24.9		51.1	41.8			42.6	
Progression Factor	1.13	0.86		0.93	1.14		1.00	1.00			1.00	
Incremental Delay, d2	10.5	12.8		26.3	2.6		34.2	0.3			0.3	
Delay (s)	80.5	41.7		82.5	31.0		85.3	42.1			42.9	
Level of Service	F	D		F	C		F	D			D	
Approach Delay (s)		44.3			37.3			64.4			42.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

3: 715 & 775 Kingston Dwy/780 Kingston Dwy & Kingston Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1905	15	0	1590	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1905	15	0	1590	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1905	15	0	1590	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.89			0.51			0.56	0.56	0.51	0.56	0.56	0.89
vC, conflicting volume	1690			1925			2802	3608	965	2625	3568	848
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1522			878			1741	3169	0	1426	3098	571
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	78
cM capacity (veh/h)	392			393			25	6	551	51	7	414

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1270	650	1060	625	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	551	414
Volume to Capacity	0.75	0.38	0.62	0.37	0.05	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4	6.5
Control Delay (s)	0.0	0.0	0.0	0.0	11.9	16.1
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		11.9	16.1
Approach LOS					B	C

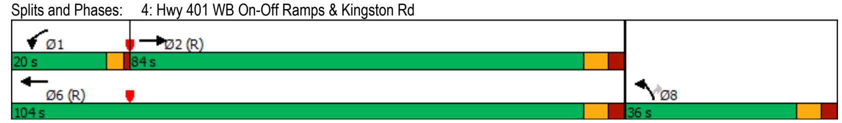
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

4: Hwy 401 WB On-Off Ramps & Kingston Rd

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1905	225	965	720	185
Future Volume (vph)	1905	225	965	720	185
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.8	18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56	0.13	0.70	0.23	0.21
v/c Ratio	0.99	0.97	0.39	0.89	0.44
Control Delay	25.7	110.9	9.2	66.0	21.5
Queue Delay	2.3	0.0	0.0	0.0	0.0
Total Delay	27.9	110.9	9.2	66.0	21.5
LOS	C	F	A	E	C
Approach Delay	27.9		28.4	56.9	
Approach LOS	C		C	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



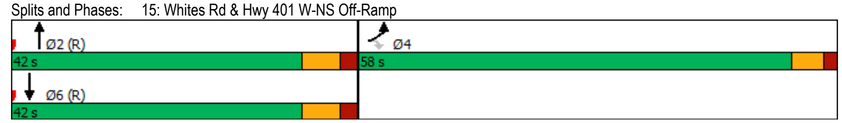
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1905	30	225	965	720	185
Future Volume (vph)	1905	30	225	965	720	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3527		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3527		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1905	30	225	965	720	185
RTOR Reduction (vph)	1	0	0	0	0	93
Lane Group Flow (vph)	1934	0	225	965	720	92
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.8		16.3	97.1	28.7	28.7
Effective Green, g (s)	77.8		18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1960		233	2477	811	324
v/s Ratio Prot	c0.55		c0.13	0.27	c0.20	
v/s Ratio Perm						0.06
v/c Ratio	0.99		0.97	0.39	0.89	0.28
Uniform Delay, d1	30.6		60.5	8.6	52.2	46.2
Progression Factor	0.43		1.00	1.00	1.00	1.00
Incremental Delay, d2	11.4		48.9	0.5	11.5	0.5
Delay (s)	24.4		109.4	9.1	63.7	46.7
Level of Service	C		F	A	E	D
Approach Delay (s)	24.4			28.1	60.2	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1725	795	1070	675
Future Volume (vph)	1725	795	1070	675
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.7	53.2	36.3	36.3
Actuated g/C Ratio	0.56	0.53	0.36	0.36
v/c Ratio	0.91	0.79	0.83	0.53
Control Delay	28.7	17.0	36.2	27.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.7	17.0	36.2	27.0
LOS	C	B	D	C
Approach Delay	25.3		36.2	27.0
Approach LOS	C		D	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 95.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1725	795	0	1070	675	0
Future Volume (vph)	1725	795	0	1070	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1725	795	0	1070	675	0
RTOR Reduction (vph)	4	158	0	0	0	0
Lane Group Flow (vph)	1801	557	0	1070	675	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	52.2	52.2		35.3	35.3	
Effective Green, g (s)	55.7	53.2		36.3	36.3	
Actuated g/C Ratio	0.56	0.53		0.36	0.36	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1970	748		1283	1283	
v/s Ratio Prot	c0.51			c0.30	0.19	
v/s Ratio Perm		0.40				
v/c Ratio	0.91	0.74		0.83	0.53	
Uniform Delay, d1	20.0	18.1		29.1	25.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.1	4.0		6.5	1.5	
Delay (s)	27.1	22.2		35.6	26.6	
Level of Service	C	C		D	C	
Approach Delay (s)	25.7			35.6	26.6	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	0	0	0	0	30	0	160	0	10	40	300
Future Volume (Veh/h)	255	0	0	0	0	30	0	160	0	10	40	300
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	255	0	0	0	0	30	0	160	0	10	40	300
Pedestrians					5							
Lane Width (m)					3.5							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	400	375	190	225	525	165	340			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	400	375	190	225	525	165	340			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	53	100	100	100	100	97	100			99		
cM capacity (veh/h)	540	553	857	726	455	873	1230			1420		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	255	30	160	10	340
Volume Left	255	0	0	10	0
Volume Right	0	30	0	0	300
cSH	540	873	1230	1420	1700
Volume to Capacity	0.47	0.03	0.00	0.01	0.20
Queue Length 95th (m)	20.1	0.9	0.0	0.2	0.0
Control Delay (s)	17.5	9.3	0.0	7.6	0.0
Lane LOS	C	A		A	
Approach Delay (s)	17.5	9.3	0.0	0.2	
Approach LOS	C	A			

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1875	125	0	1700	0	0
Future Volume (Veh/h)	1875	125	0	1700	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1875	125	0	1700	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.81		0.76	0.81
vC, conflicting volume			2000		2788	1000
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1762		1589	524
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			290		77	406

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1250	750	850	850
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.74	0.44	0.50	0.50
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

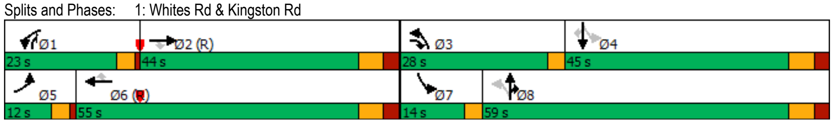
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

2034 Future Background Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	320	670	180	965	360	230	460	460	165	1150	125
Future Volume (vph)	105	320	670	180	965	360	230	460	460	165	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	10.9	40.7	70.8	18.3	48.1	48.1	71.5	52.2	73.4	53.7	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.51	0.13	0.34	0.34	0.51	0.37	0.52	0.38	0.27	0.27
v/c Ratio	0.76	0.32	0.83	0.76	0.82	0.51	0.55	0.25	0.51	0.41	0.85	0.25
Control Delay	94.9	40.9	35.0	73.7	38.1	9.0	32.9	30.7	9.7	23.5	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.9	40.9	35.0	73.7	38.1	9.0	32.9	30.7	9.7	23.5	55.0	5.6
LOS	F	D	D	E	D	A	C	C	A	C	D	A
Approach Delay		42.5			35.4			22.8			47.1	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 94.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



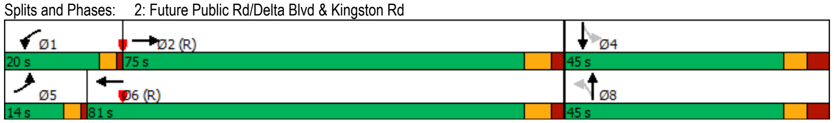
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	320	670	180	965	360	230	460	460	165	1150	125
Future Volume (vph)	105	320	670	180	965	360	230	460	460	165	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	320	670	180	965	360	230	460	460	165	1150	125
RTOR Reduction (vph)	0	0	49	0	0	202	0	0	123	0	0	91
Lane Group Flow (vph)	105	320	621	180	965	158	230	460	337	165	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	9.9	39.6	64.7	17.3	47.0	47.0	65.0	51.2	75.6	47.7	36.9	36.9
Effective Green, g (s)	10.9	40.6	66.7	18.3	48.0	48.0	67.5	52.2	76.6	49.7	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.48	0.13	0.34	0.34	0.48	0.37	0.55	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	138	986	721	237	1177	501	410	1838	813	378	1361	400
v/s Ratio Prot	0.06	0.09	c0.16	c0.10	c0.28		0.11	0.09	0.23	0.04	c0.23	
v/s Ratio Perm			0.25			0.11	0.16			0.12		0.02
v/c Ratio	0.76	0.32	0.86	0.76	0.82	0.31	0.56	0.25	0.41	0.44	0.84	0.08
Uniform Delay, d1	63.3	39.0	32.5	58.7	42.0	33.9	30.5	30.4	18.6	32.1	48.3	38.1
Progression Factor	1.00	1.00	1.00	0.96	0.77	1.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.6	0.9	10.3	11.0	5.4	1.4	1.8	0.1	0.3	0.8	5.0	0.1
Delay (s)	84.8	39.8	42.8	67.5	37.9	38.5	32.3	30.4	18.9	32.9	53.3	38.2
Level of Service	F	D	D	E	D	D	C	C	B	C	D	D
Approach Delay (s)		46.0			41.6			26.2			49.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	835	55	1385	40	0	60	10
Future Volume (vph)	95	835	55	1385	40	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	13.7	102.8	11.1	98.2	12.2	12.2		12.2
Actuated g/C Ratio	0.10	0.73	0.08	0.70	0.09	0.09		0.09
v/c Ratio	0.53	0.34	0.43	0.62	0.48	0.06		0.57
Control Delay	65.0	8.1	74.7	15.9	78.8	0.3		27.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0		0.0
Total Delay	65.0	8.1	74.7	16.0	78.8	0.3		27.8
LOS	E	A	E	B	E	A		C
Approach Delay		13.9		18.1		52.6		27.8
Approach LOS		B		B		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 87.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	835	10	55	1385	105	40	0	20	60	10	135
Future Volume (vph)	95	835	10	55	1385	105	40	0	20	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3396		1611	3428		1709	1426			3129	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.86	
Satd. Flow (perm)	1837	3396		1611	3428		965	1426			2735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	835	10	55	1385	105	40	0	20	60	10	135
RTOR Reduction (vph)	0	0	0	0	3	0	0	18	0	0	123	0
Lane Group Flow (vph)	95	845	0	55	1487	0	40	2	0	0	82	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.7	101.0		8.9	97.2		11.2	11.2			11.2	
Effective Green, g (s)	13.7	102.0		9.9	98.2		12.2	12.2			12.2	
Actuated g/C Ratio	0.10	0.73		0.07	0.70		0.09	0.09			0.09	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	179	2474		113	2404		84	124			238	
v/s Ratio Prot	c0.05	0.25		0.03	c0.43			0.00				
v/s Ratio Perm							c0.04				0.03	
v/c Ratio	0.53	0.34		0.49	0.62		0.48	0.01			0.34	
Uniform Delay, d1	60.1	6.9		62.6	11.0		60.9	58.4			60.1	
Progression Factor	0.93	1.03		1.08	1.23		1.00	1.00			1.00	
Incremental Delay, d2	2.8	0.3		2.8	1.0		4.2	0.0			0.9	
Delay (s)	58.7	7.4		70.7	14.6		65.1	58.4			61.0	
Level of Service	E	A		E	B		E	E			E	
Approach Delay (s)		12.6			16.6			62.9			61.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	925	25	0	1490	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	925	25	0	1490	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	925	25	0	1490	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.89			0.91			0.93	0.93	0.91	0.93	0.93	0.89
vC, conflicting volume	1560			950			1738	2498	475	2000	2478	782
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1377			756			1224	2041	235	1506	2019	500
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	88
cM capacity (veh/h)	419			789			112	53	705	77	55	454

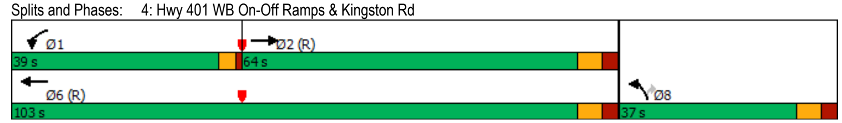
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	617	333	993	562	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	705	454
Volume to Capacity	0.36	0.20	0.58	0.33	0.01	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.3
Control Delay (s)	0.0	0.0	0.0	0.0	10.2	14.0
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.2	14.0
Approach LOS					B	B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	930	350	935	620	90
Future Volume (vph)	930	350	935	620	90
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	62.1	32.1	97.2	30.6	30.6
Actuated g/C Ratio	0.44	0.23	0.69	0.22	0.22
v/c Ratio	0.61	0.85	0.39	0.82	0.23
Control Delay	25.0	70.5	9.9	61.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	70.5	9.9	61.6	16.0
LOS	C	E	A	E	B
Approach Delay	25.0		26.4	55.8	
Approach LOS	C		C	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 33.1	Intersection LOS: C
Intersection Capacity Utilization 76.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	930	5	350	935	620	90
Future Volume (vph)	930	5	350	935	620	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3431		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3431		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	930	5	350	935	620	90
RTOR Reduction (vph)	0	0	0	0	0	52
Lane Group Flow (vph)	935	0	350	935	620	38
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	61.1		31.1	96.2	29.6	29.6
Effective Green, g (s)	62.1		32.1	97.2	30.6	30.6
Actuated g/C Ratio	0.44		0.23	0.69	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1521		412	2406	756	331
v/s Ratio Prot	c0.27		c0.19	0.27	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.61		0.85	0.39	0.82	0.11
Uniform Delay, d1	29.8		51.6	9.0	52.1	43.8
Progression Factor	0.74		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8		15.0	0.5	7.1	0.2
Delay (s)	23.7		66.7	9.4	59.2	44.0
Level of Service	C		E	A	E	D
Approach Delay (s)	23.7			25.0	57.3	
Approach LOS	C			C	E	

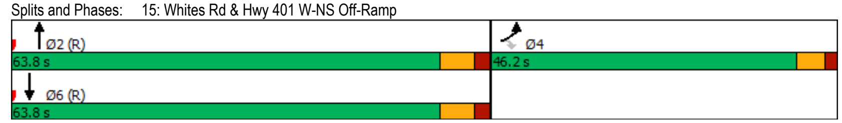
Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	675	355	945	655
Future Volume (vph)	675	355	945	655
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	30.5	30.5	69.0	69.0
Actuated g/C Ratio	0.28	0.28	0.63	0.63
v/c Ratio	0.76	0.55	0.43	0.30
Control Delay	41.2	10.0	12.0	10.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.2	10.0	12.0	10.5
LOS	D	A	B	B
Approach Delay	31.5		12.0	10.5
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	675	355	0	945	655	0
Future Volume (vph)	675	355	0	945	655	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3371	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3371	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	675	355	0	945	655	0
RTOR Reduction (vph)	4	194	0	0	0	0
Lane Group Flow (vph)	707	125	0	945	655	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.5	29.5		68.0	68.0	
Effective Green, g (s)	30.5	30.5		69.0	69.0	
Actuated g/C Ratio	0.28	0.28		0.63	0.63	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	934	382		2174	2195	
v/s Ratio Prot	c0.21			c0.27	0.19	
v/s Ratio Perm		0.09				
v/c Ratio	0.76	0.33		0.43	0.30	
Uniform Delay, d1	36.4	31.6		10.5	9.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.5		0.6	0.3	
Delay (s)	39.9	32.1		11.1	9.7	
Level of Service	D	C		B	A	
Approach Delay (s)	37.5			11.1	9.7	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Future Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	0	0	0	10	0	20	0	10	5	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	30	10	20	10	30
Volume Left (vph)	30	0	0	10	0
Volume Right (vph)	0	10	0	0	25
Hadj (s)	0.20	-0.60	0.17	0.50	-0.53
Departure Headway (s)	4.2	3.5	4.3	5.1	4.1
Degree Utilization, x	0.04	0.01	0.02	0.01	0.03
Capacity (veh/h)	832	1015	818	697	863
Control Delay (s)	7.4	6.5	7.4	7.0	6.0
Approach Delay (s)	7.4	6.5	7.4	6.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	6.9		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	940	5	0	1495	0	0
Future Volume (Veh/h)	940	5	0	1495	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	940	5	0	1495	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.93		0.81	0.93
vC, conflicting volume			945		1690	472
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			793		993	286
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			779		198	668

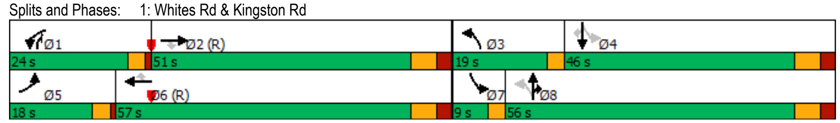
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	627	318	748	748
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.37	0.19	0.44	0.44
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	750	520	195	980	550	375	1100	965	185	750	190
Future Volume (vph)	185	750	520	195	980	550	375	1100	965	185	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	16.6	48.9	48.9	19.6	51.9	51.9	62.4	45.2	67.8	52.0	34.8	34.8
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.37	0.37	0.45	0.32	0.48	0.37	0.25	0.25
v/c Ratio	0.85	0.61	0.75	0.77	0.75	0.86	0.93	0.66	0.88	0.78	0.59	0.37
Control Delay	92.3	41.1	27.3	86.7	37.4	37.4	58.7	42.6	18.7	50.3	47.9	8.4
Queue Delay	0.0	1.1	0.0	0.0	0.1	0.6	0.0	0.0	1.5	0.0	0.0	0.0
Total Delay	92.3	42.2	27.3	86.7	37.5	38.0	58.7	42.6	20.1	50.3	47.9	8.4
LOS	F	D	C	F	D	D	E	D	C	D	D	A
Approach Delay		43.2			43.2			36.2			41.6	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 40.4	Intersection LOS: D
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



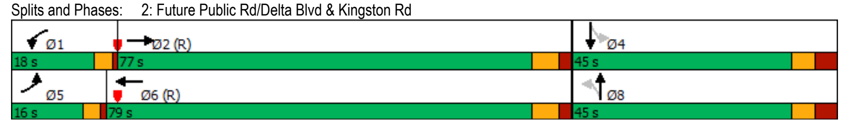
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	750	520	195	980	550	375	1100	965	185	750	190
Future Volume (vph)	185	750	520	195	980	550	375	1100	965	185	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.23	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	424	5129	1561	317	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	750	520	195	980	550	375	1100	965	185	750	190
RTOR Reduction (vph)	0	0	175	0	0	84	0	0	331	0	0	135
Lane Group Flow (vph)	185	750	345	195	980	466	375	1100	634	185	750	55
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	15.6	48.0	48.0	18.6	51.0	51.0	55.3	44.2	69.9	41.9	33.8	33.8
Effective Green, g (s)	16.6	49.0	49.0	19.6	52.0	52.0	58.3	45.2	70.9	47.9	34.8	34.8
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.37	0.37	0.42	0.32	0.51	0.34	0.25	0.25
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	217	1237	519	254	1313	554	393	1655	790	227	1262	372
v/s Ratio Prot	0.10	0.21		0.11	0.28		c0.15	0.21	c0.41	0.06	0.15	
v/s Ratio Perm			0.23			c0.31	0.25			0.21		0.04
v/c Ratio	0.85	0.61	0.67	0.77	0.75	0.84	0.95	0.66	0.80	0.81	0.59	0.15
Uniform Delay, d1	60.5	37.5	38.5	58.0	38.3	40.2	31.4	40.9	28.7	34.4	46.4	41.0
Progression Factor	1.00	1.00	1.00	1.26	0.89	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.1	2.2	6.6	8.9	2.6	10.0	33.5	1.0	5.9	19.7	0.8	0.2
Delay (s)	86.6	39.8	45.1	82.2	36.6	44.6	64.8	41.9	34.6	54.1	47.1	41.2
Level of Service	F	D	D	F	D	D	E	D	C	D	D	D
Approach Delay (s)		47.6			44.3			42.5			47.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1610	115	1460	175	20	105	15
Future Volume (vph)	125	1610	115	1460	175	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	14.1	80.7	14.0	80.6	29.4	29.4		29.4
Actuated g/C Ratio	0.10	0.58	0.10	0.58	0.21	0.21		0.21
v/c Ratio	0.68	0.82	0.63	0.78	0.85	0.33		0.42
Control Delay	77.1	24.0	73.2	28.2	84.5	11.8		22.3
Queue Delay	0.0	1.1	0.0	0.3	0.0	0.0		0.0
Total Delay	77.1	25.1	73.2	28.5	84.5	11.8		22.3
LOS	E	C	E	C	F	B		C
Approach Delay		28.7		31.5		52.1		22.3
Approach LOS		C		C		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 100.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1610	45	115	1460	110	175	20	120	105	15	140
Future Volume (vph)	125	1610	45	115	1460	110	175	20	120	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.87			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3517		1837	3488		1805	1599			3154	
Flt Permitted	1.00	1.00		1.00	1.00		0.55	1.00			0.75	
Satd. Flow (perm)	1837	3517		1837	3488		990	1599			2405	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1610	45	115	1460	110	175	20	120	105	15	140
RTOR Reduction (vph)	0	1	0	0	3	0	0	95	0	0	111	0
Lane Group Flow (vph)	125	1654	0	115	1567	0	175	45	0	0	149	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.1	79.7		13.0	79.6		28.4	28.4			28.4	
Effective Green, g (s)	14.1	80.7		14.0	80.6		29.4	29.4			29.4	
Actuated g/C Ratio	0.10	0.58		0.10	0.58		0.21	0.21			0.21	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	185	2027		183	2008		207	335			505	
v/s Ratio Prot	c0.07	c0.47		0.06	0.45			0.03				
v/s Ratio Perm							c0.18				0.06	
v/c Ratio	0.68	0.82		0.63	0.78		0.85	0.13			0.30	
Uniform Delay, d1	60.7	23.7		60.5	22.9		53.1	45.0			46.6	
Progression Factor	1.08	0.83		1.00	1.03		1.00	1.00			1.00	
Incremental Delay, d2	6.1	2.4		5.5	2.6		25.8	0.2			0.3	
Delay (s)	71.6	22.1		65.9	26.2		78.9	45.1			46.9	
Level of Service	E	C		E	C		E	D			D	
Approach Delay (s)		25.6			28.9			63.9			46.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1850	15	0	1595	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1850	15	0	1595	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1850	15	0	1595	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.88			0.61			0.67	0.67	0.61	0.67	0.67	0.88
vC, conflicting volume	1695			1870			2750	3558	938	2602	3518	850
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1523			1147			1843	3052	0	1622	2992	567
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	78
cM capacity (veh/h)	391			375			25	8	663	44	9	415

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1233	632	1063	627	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	663	415
Volume to Capacity	0.73	0.37	0.63	0.37	0.05	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1	6.5
Control Delay (s)	0.0	0.0	0.0	0.0	10.7	16.1
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		10.7	16.1
Approach LOS					B	C

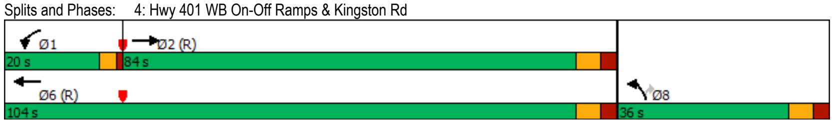
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1860	225	980	710	305
Future Volume (vph)	1860	225	980	710	305
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.2	19.0	98.2	32.1	29.6
Actuated g/C Ratio	0.55	0.14	0.70	0.23	0.21
v/c Ratio	0.97	0.93	0.40	0.88	0.64
Control Delay	26.2	101.6	9.2	65.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	101.6	9.3	65.1	24.0
LOS	C	F	A	E	C
Approach Delay	26.2		26.5	52.8	
Approach LOS	C		C	D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 32.9 Intersection LOS: C
Intersection Capacity Utilization 97.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1860	20	225	980	710	305
Future Volume (vph)	1860	20	225	980	710	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3529		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3529		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1860	20	225	980	710	305
RTOR Reduction (vph)	0	0	0	0	0	155
Lane Group Flow (vph)	1880	0	225	980	710	150
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.2		17.0	97.2	28.6	28.6
Effective Green, g (s)	77.2		19.0	98.2	32.1	29.6
Actuated g/C Ratio	0.55		0.14	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1945		241	2479	808	323
v/s Ratio Prot	c0.53		c0.13	0.28	c0.20	
v/s Ratio Perm						0.10
v/c Ratio	0.97		0.93	0.40	0.88	0.46
Uniform Delay, d1	30.2		59.9	8.6	52.1	48.3
Progression Factor	0.49		1.00	1.00	1.00	1.00
Incremental Delay, d2	10.5		39.9	0.5	10.7	1.1
Delay (s)	25.4		99.8	9.1	62.8	49.3
Level of Service	C		F	A	E	D
Approach Delay (s)	25.4			26.0	58.7	
Approach LOS	C			C	E	

Intersection Summary

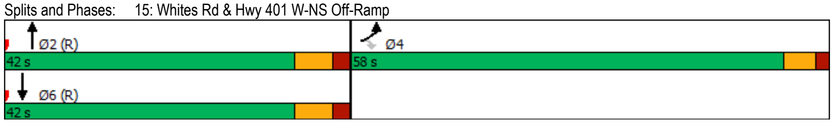
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1705	795	1080	710
Future Volume (vph)	1705	795	1080	710
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.6	53.1	36.4	36.4
Actuated g/C Ratio	0.56	0.53	0.36	0.36
v/c Ratio	0.91	0.79	0.84	0.55
Control Delay	27.8	17.0	36.5	27.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.8	17.0	36.5	27.4
LOS	C	B	D	C
Approach Delay	24.7		36.5	27.4
Approach LOS	C		D	C

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 28.1 Intersection LOS: C
Intersection Capacity Utilization 95.1% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1705	795	0	1080	710	0
Future Volume (vph)	1705	795	0	1080	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1705	795	0	1080	710	0
RTOR Reduction (vph)	4	159	0	0	0	0
Lane Group Flow (vph)	1781	556	0	1080	710	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	52.1	52.1		35.4	35.4	
Effective Green, g (s)	55.6	53.1		36.4	36.4	
Actuated g/C Ratio	0.56	0.53		0.36	0.36	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1967	747		1286	1286	
v/s Ratio Prot	c0.50			c0.31	0.20	
v/s Ratio Perm		0.40				
v/c Ratio	0.91	0.74		0.84	0.55	
Uniform Delay, d1	19.9	18.2		29.1	25.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.4	4.1		6.7	1.7	
Delay (s)	26.3	22.2		35.8	27.0	
Level of Service	C	C		D	C	
Approach Delay (s)	25.1			35.8	27.0	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Future Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	125	0	0	0	0	30	0	160	0	10	40	95

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	125	30	160	10	135
Volume Left (vph)	125	0	0	10	0
Volume Right (vph)	0	30	0	0	95
Hadj (s)	0.20	-0.55	0.02	0.50	-0.47
Departure Headway (s)	4.8	4.2	4.6	5.5	4.6
Degree Utilization, x	0.17	0.04	0.20	0.02	0.17
Capacity (veh/h)	694	775	755	622	756
Control Delay (s)	8.8	7.4	8.7	7.4	7.3
Approach Delay (s)	8.8	7.4	8.7	7.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1780	125	0	1740	0	0
Future Volume (Veh/h)	1780	125	0	1740	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1780	125	0	1740	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.83		0.74	0.83
vC, conflicting volume			1905		2712	952
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1674		1545	520
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			321		79	418

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1187	718	870	870
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.70	0.42	0.51	0.51
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

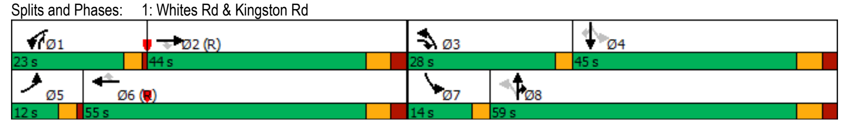
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

2034 Future Total Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	325	670	225	1020	405	230	460	485	185	1150	125
Future Volume (vph)	105	325	670	225	1020	405	230	460	485	185	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	11.0	39.4	68.8	20.2	48.6	48.6	70.9	51.3	74.6	53.9	37.9	37.9
Actuated g/C Ratio	0.08	0.28	0.49	0.14	0.35	0.35	0.51	0.37	0.53	0.38	0.27	0.27
v/c Ratio	0.75	0.34	0.85	0.86	0.86	0.56	0.57	0.25	0.53	0.46	0.85	0.25
Control Delay	93.3	41.6	37.5	91.9	43.4	12.7	33.7	31.2	11.3	24.8	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.3	41.6	37.5	91.9	43.4	12.7	33.7	31.2	11.3	24.8	55.0	5.6
LOS	F	D	D	F	D	B	C	C	B	C	D	A
Approach Delay		44.0			42.5			23.5			46.9	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	325	670	225	1020	405	230	460	485	185	1150	125
Future Volume (vph)	105	325	670	225	1020	405	230	460	485	185	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	325	670	225	1020	405	230	460	485	185	1150	125
RTOR Reduction (vph)	0	0	50	0	0	214	0	0	114	0	0	91
Lane Group Flow (vph)	105	325	620	225	1020	191	230	460	371	185	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	10.0	38.4	62.8	19.2	47.6	47.6	64.3	50.4	76.7	47.8	36.9	36.9
Effective Green, g (s)	11.0	39.4	64.8	20.2	48.6	48.6	66.8	51.4	77.7	49.8	37.9	37.9
Actuated g/C Ratio	0.08	0.28	0.46	0.14	0.35	0.35	0.48	0.37	0.56	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	140	956	700	262	1191	507	401	1810	825	380	1361	400
v/s Ratio Prot	0.06	0.10	c0.16	c0.12	c0.30		0.11	0.09	0.25	0.04	c0.23	
v/s Ratio Perm			0.25			0.13	0.16			0.13		0.02
v/c Ratio	0.75	0.34	0.89	0.86	0.86	0.38	0.57	0.25	0.45	0.49	0.84	0.08
Uniform Delay, d1	63.2	40.0	34.2	58.5	42.5	34.3	31.0	30.9	18.5	32.4	48.3	38.1
Progression Factor	1.00	1.00	1.00	1.21	0.87	1.40	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	1.0	12.8	17.8	5.9	1.5	2.0	0.1	0.4	1.0	5.0	0.1
Delay (s)	83.1	40.9	47.0	88.4	43.0	49.7	33.0	31.0	18.9	33.4	53.3	38.2
Level of Service	F	D	D	F	D	D	C	C	B	C	D	D
Approach Delay (s)		48.7			50.8			26.4			49.5	
Approach LOS		D			D			C			D	

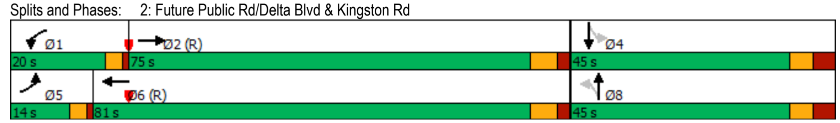
Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	830	100	1385	185	0	60	10
Future Volume (vph)	95	830	100	1385	185	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	12.3	80.1	14.3	82.0	29.8	29.8		29.8
Actuated g/C Ratio	0.09	0.57	0.10	0.59	0.21	0.21		0.21
v/c Ratio	0.59	0.46	0.61	0.74	0.82	0.35		0.34
Control Delay	74.5	20.4	67.3	32.3	78.6	2.0		16.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0		0.0
Total Delay	74.5	20.4	67.3	32.5	78.6	2.0		16.8
LOS	E	C	E	C	E	A		B
Approach Delay		25.6		34.6		40.9		16.8
Approach LOS		C		C		D		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	830	65	100	1385	105	185	0	180	60	10	135
Future Volume (vph)	95	830	65	100	1385	105	185	0	180	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3375		1611	3428		1709	1426			3130	
Flt Permitted	1.00	1.00		1.00	1.00		0.62	1.00			0.73	
Satd. Flow (perm)	1837	3375		1611	3428		1064	1426			2318	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	830	65	100	1385	105	185	0	180	60	10	135
RTOR Reduction (vph)	0	3	0	0	4	0	0	142	0	0	106	0
Lane Group Flow (vph)	95	892	0	100	1486	0	185	38	0	0	99	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	11.3	79.0		13.3	81.0		28.8	28.8			28.8	
Effective Green, g (s)	12.3	80.0		14.3	82.0		29.8	29.8			29.8	
Actuated g/C Ratio	0.09	0.57		0.10	0.59		0.21	0.21			0.21	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	161	1928		164	2007		226	303			493	
v/s Ratio Prot	0.05	0.26		c0.06	c0.43			0.03				
v/s Ratio Perm							c0.17				0.04	
v/c Ratio	0.59	0.46		0.61	0.74		0.82	0.13			0.20	
Uniform Delay, d1	61.4	17.5		60.2	21.2		52.5	44.6			45.3	
Progression Factor	0.99	1.04		0.90	1.31		1.00	1.00			1.00	
Incremental Delay, d2	5.1	0.7		5.4	2.1		20.1	0.2			0.2	
Delay (s)	66.2	18.9		59.5	30.0		72.6	44.8			45.5	
Level of Service	E	B		E	C		E	D			D	
Approach Delay (s)		23.4			31.9			58.9			45.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1080	25	0	1535	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	1080	25	0	1535	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1080	25	0	1535	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.88			0.85			0.91	0.91	0.85	0.91	0.91	0.88
vC, conflicting volume	1605			1105			1915	2698	552	2122	2678	805
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1419			777			1229	2088	129	1457	2066	513
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	88
cM capacity (veh/h)	401			723			108	48	770	83	50	443

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	720	385	1023	577	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	770	443
Volume to Capacity	0.42	0.23	0.60	0.34	0.01	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.4
Control Delay (s)	0.0	0.0	0.0	0.0	9.7	14.3
Lane LOS					A	B
Approach Delay (s)	0.0		0.0		9.7	14.3
Approach LOS					A	B

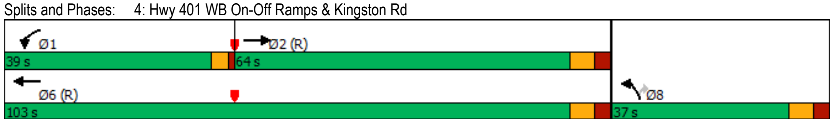
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1045	350	970	630	90
Future Volume (vph)	1045	350	970	630	90
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	63.0	31.9	97.8	30.0	30.0
Actuated g/C Ratio	0.45	0.23	0.70	0.21	0.21
v/c Ratio	0.71	0.85	0.40	0.85	0.24
Control Delay	17.3	71.4	9.6	64.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	71.4	9.6	64.7	17.0
LOS	B	E	A	E	B
Approach Delay	17.3		26.0	58.7	
Approach LOS	B		C	E	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 81.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1045	45	350	970	630	90
Future Volume (vph)	1045	45	350	970	630	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3417		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3417		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1045	45	350	970	630	90
RTOR Reduction (vph)	2	0	0	0	0	52
Lane Group Flow (vph)	1088	0	350	970	630	38
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	61.9		30.9	96.8	29.0	29.0
Effective Green, g (s)	62.9		31.9	97.8	30.0	30.0
Actuated g/C Ratio	0.45		0.23	0.70	0.21	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1535		410	2421	741	324
v/s Ratio Prot	c0.32		c0.19	0.28	c0.18	
v/s Ratio Perm						0.03
v/c Ratio	0.71		0.85	0.40	0.85	0.12
Uniform Delay, d1	31.1		51.8	8.8	52.8	44.3
Progression Factor	0.45		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6		15.7	0.5	9.2	0.2
Delay (s)	16.7		67.5	9.3	62.1	44.5
Level of Service	B		E	A	E	D
Approach Delay (s)	16.7			24.8	59.9	
Approach LOS	B			C	E	

Intersection Summary

HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

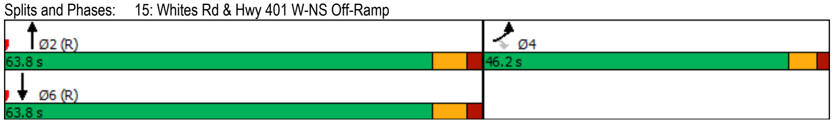
c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	695	355	950	650
Future Volume (vph)	695	355	950	650
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	31.1	31.1	68.4	68.4
Actuated g/C Ratio	0.28	0.28	0.62	0.62
v/c Ratio	0.76	0.55	0.44	0.30
Control Delay	41.0	9.7	12.4	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.0	9.7	12.4	10.8
LOS	D	A	B	B
Approach Delay	31.5		12.4	10.8
Approach LOS	C		B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 58.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	695	355	0	950	650	0
Future Volume (vph)	695	355	0	950	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3372	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3372	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	695	355	0	950	650	0
RTOR Reduction (vph)	4	192	0	0	0	0
Lane Group Flow (vph)	727	127	0	950	650	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	30.1	30.1		67.4	67.4	
Effective Green, g (s)	31.1	31.1		68.4	68.4	
Actuated g/C Ratio	0.28	0.28		0.62	0.62	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	953	389		2155	2176	
v/s Ratio Prot	c0.22			c0.27	0.19	
v/s Ratio Perm		0.09				
v/c Ratio	0.76	0.33		0.44	0.30	
Uniform Delay, d1	36.1	31.2		10.8	9.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.5		0.7	0.4	
Delay (s)	39.7	31.7		11.5	10.0	
Level of Service	D	C		B	B	
Approach Delay (s)	37.3			11.5	10.0	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

16: Future Public Rd & Site Dwy/715 & 775 Kingston Dwy

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	0	0	0	0	10	0	20	0	10	5	125
Future Volume (Veh/h)	335	0	0	0	0	10	0	20	0	10	5	125
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	335	0	0	0	0	10	0	20	0	10	5	125
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	118	108	68	45	170	20	130			20		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	118	108	68	45	170	20	130			20		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	61	100	100	100	100	99	100			99		
cM capacity (veh/h)	851	781	1002	957	722	1064	1468			1609		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	335	10	20	10	130
Volume Left	335	0	0	10	0
Volume Right	0	10	0	0	125
cSH	851	1064	1468	1609	1700
Volume to Capacity	0.39	0.01	0.00	0.01	0.08
Queue Length 95th (m)	15.1	0.2	0.0	0.2	0.0
Control Delay (s)	11.9	8.4	0.0	7.3	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.9	8.4	0.0	0.5	
Approach LOS	B	A			

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

21: Kingston Rd

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	990	5	0	1640	0	0
Future Volume (Veh/h)	990	5	0	1640	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	990	5	0	1640	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.93		0.72	0.93
vC, conflicting volume			995		1812	498
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			842		903	306
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			746		202	646

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	660	335	820	820
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.39	0.20	0.48	0.48
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

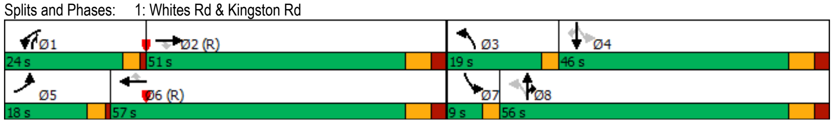
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	765	520	210	990	575	375	1100	1030	215	750	190
Future Volume (vph)	185	765	520	210	990	575	375	1100	1030	215	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	15.4	46.8	46.8	20.1	51.6	51.6	64.0	47.1	70.2	54.5	37.5	37.5
Actuated g/C Ratio	0.11	0.33	0.33	0.14	0.37	0.37	0.46	0.34	0.50	0.39	0.27	0.27
v/c Ratio	0.92	0.65	0.77	0.80	0.76	0.91	0.92	0.64	0.92	0.89	0.55	0.36
Control Delay	106.2	43.1	29.4	81.5	42.8	46.1	57.5	40.9	24.5	65.4	45.3	8.1
Queue Delay	0.0	51.5	0.0	0.0	0.1	0.8	0.0	0.0	10.6	0.0	0.0	0.0
Total Delay	106.2	94.7	29.4	81.5	43.0	46.9	57.5	40.9	35.1	65.4	45.3	8.1
LOS	F	F	C	F	D	D	E	D	D	E	D	A
Approach Delay		73.1			48.8			41.0			43.0	
Approach LOS		E			D			D			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 50.2 Intersection LOS: D
Intersection Capacity Utilization 120.6% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



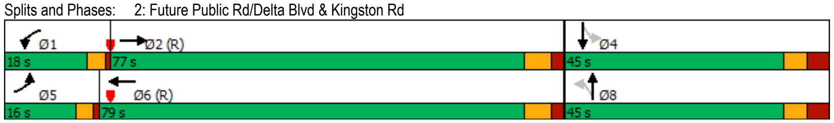
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	765	520	210	990	575	375	1100	1030	215	750	190
Future Volume (vph)	185	765	520	210	990	575	375	1100	1030	215	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.24	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	448	5129	1561	322	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	765	520	210	990	575	375	1100	1030	215	750	190
RTOR Reduction (vph)	0	0	175	0	0	84	0	0	320	0	0	132
Lane Group Flow (vph)	185	765	345	210	990	491	375	1100	710	215	750	58
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	14.4	45.8	45.8	19.1	50.5	50.5	57.0	46.1	72.3	44.5	36.6	36.6
Effective Green, g (s)	15.4	46.8	46.8	20.1	51.5	51.5	60.0	47.1	73.3	50.5	37.6	37.6
Actuated g/C Ratio	0.11	0.33	0.33	0.14	0.37	0.37	0.43	0.34	0.52	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	1181	495	261	1300	548	393	1725	817	232	1364	402
v/s Ratio Prot	0.10	0.22		0.12	0.28		c0.14	0.21	c0.45	0.07	0.15	
v/s Ratio Perm			0.23			c0.33	0.27			0.26		0.04
v/c Ratio	0.92	0.65	0.70	0.80	0.76	0.90	0.95	0.64	0.87	0.93	0.55	0.15
Uniform Delay, d1	61.7	39.6	40.4	58.0	38.9	41.7	30.2	39.2	29.2	34.8	43.9	39.0
Progression Factor	1.00	1.00	1.00	1.16	1.02	1.02	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.2	2.8	7.9	10.3	2.6	13.1	33.5	0.8	9.8	39.1	0.5	0.2
Delay (s)	101.9	42.4	48.3	77.6	42.4	55.9	63.6	40.0	38.9	73.9	44.4	39.1
Level of Service	F	D	D	E	D	E	E	D	D	E	D	D
Approach Delay (s)		52.0			50.9			43.1			49.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	120.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1610	200	1460	225	20	105	15
Future Volume (vph)	125	1610	200	1460	225	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	12.8	72.1	17.6	76.9	34.4	34.4		34.4
Actuated g/C Ratio	0.09	0.52	0.13	0.55	0.25	0.25		0.25
v/c Ratio	0.74	0.98	0.87	0.82	0.90	0.40		0.40
Control Delay	83.1	42.2	86.8	33.5	87.4	11.9		20.9
Queue Delay	0.0	33.2	0.0	0.4	0.0	0.0		0.0
Total Delay	83.1	75.4	86.8	33.9	87.4	11.9		20.9
LOS	F	E	F	C	F	B		C
Approach Delay		75.9		39.8		51.0		20.9
Approach LOS		E		D		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 55.5	Intersection LOS: E
Intersection Capacity Utilization 111.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1610	155	200	1460	110	225	20	190	105	15	140
Future Volume (vph)	125	1610	155	200	1460	110	225	20	190	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3479		1837	3488		1804	1589			3155	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.68	
Satd. Flow (perm)	1837	3479		1837	3488		1014	1589			2186	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1610	155	200	1460	110	225	20	190	105	15	140
RTOR Reduction (vph)	0	5	0	0	4	0	0	129	0	0	106	0
Lane Group Flow (vph)	125	1760	0	200	1566	0	225	81	0	0	154	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	11.8	71.1		16.6	75.9		33.4	33.4			33.4	
Effective Green, g (s)	12.8	72.1		17.6	76.9		34.4	34.4			34.4	
Actuated g/C Ratio	0.09	0.51		0.13	0.55		0.25	0.25			0.25	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	167	1791		230	1915		249	390			537	
v/s Ratio Prot	0.07	c0.51		c0.11	0.45			0.05				
v/s Ratio Perm							c0.22				0.07	
v/c Ratio	0.75	0.98		0.87	0.82		0.90	0.21			0.29	
Uniform Delay, d1	62.0	33.3		60.1	25.8		51.2	42.0			42.9	
Progression Factor	1.09	0.89		0.96	1.11		1.00	1.00			1.00	
Incremental Delay, d2	9.8	12.4		23.7	3.3		32.5	0.3			0.3	
Delay (s)	77.6	42.0		81.2	32.0		83.7	42.2			43.2	
Level of Service	E	D		F	C		F	D			D	
Approach Delay (s)		44.3			37.6			63.7			43.2	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1920	15	0	1680	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1920	15	0	1680	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1920	15	0	1680	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.87			0.50			0.57	0.57	0.50	0.57	0.57	0.87
vC, conflicting volume	1780			1940			2862	3712	972	2722	3672	892
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1598			891			1727	3224	0	1480	3154	578
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	78
cM capacity (veh/h)	360			385			25	6	546	47	6	403

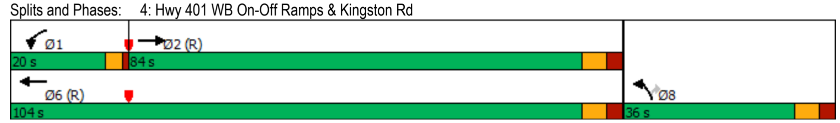
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1280	655	1120	655	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	546	403
Volume to Capacity	0.75	0.39	0.66	0.39	0.05	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4	6.8
Control Delay (s)	0.0	0.0	0.0	0.0	12.0	16.5
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		12.0	16.5
Approach LOS					B	C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1920	225	1055	720	305
Future Volume (vph)	1920	225	1055	720	305
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.8	18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56	0.13	0.70	0.23	0.21
v/c Ratio	0.99	0.97	0.43	0.89	0.64
Control Delay	27.3	110.9	9.6	66.0	24.3
Queue Delay	2.5	0.0	0.0	0.0	0.0
Total Delay	29.8	110.9	9.7	66.0	24.3
LOS	C	F	A	E	C
Approach Delay	29.8		27.4	53.6	
Approach LOS	C		C	D	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 34.8 Intersection LOS: C
Intersection Capacity Utilization 99.4% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



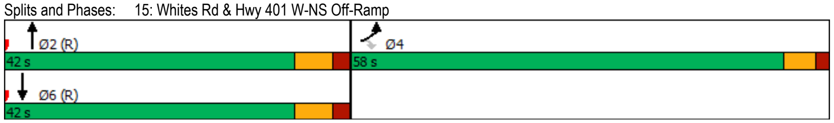
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1920	30	225	1055	720	305
Future Volume (vph)	1920	30	225	1055	720	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3527		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3527		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1920	30	225	1055	720	305
RTOR Reduction (vph)	1	0	0	0	0	154
Lane Group Flow (vph)	1949	0	225	1055	720	151
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.8		16.3	97.1	28.7	28.7
Effective Green, g (s)	77.8		18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1960		233	2477	811	324
v/s Ratio Prot	c0.55		c0.13	0.30	c0.20	
v/s Ratio Perm						0.10
v/c Ratio	0.99		0.97	0.43	0.89	0.47
Uniform Delay, d1	30.9		60.5	8.9	52.2	48.2
Progression Factor	0.42		1.00	1.00	1.00	1.00
Incremental Delay, d2	12.8		48.9	0.5	11.5	1.1
Delay (s)	25.9		109.4	9.5	63.7	49.3
Level of Service	C		F	A	E	D
Approach Delay (s)	25.9			27.0	59.4	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1770	795	1080	710
Future Volume (vph)	1770	795	1080	710
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.9	53.4	36.1	36.1
Actuated g/C Ratio	0.56	0.53	0.36	0.36
v/c Ratio	0.93	0.79	0.85	0.56
Control Delay	30.7	16.8	37.0	27.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.7	16.8	37.0	27.6
LOS	C	B	D	C
Approach Delay	26.8		37.0	27.6
Approach LOS	C		D	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 96.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1770	795	0	1080	710	0
Future Volume (vph)	1770	795	0	1080	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1770	795	0	1080	710	0
RTOR Reduction (vph)	3	158	0	0	0	0
Lane Group Flow (vph)	1847	557	0	1080	710	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	52.4	52.4		35.1	35.1	
Effective Green, g (s)	55.9	53.4		36.1	36.1	
Actuated g/C Ratio	0.56	0.53		0.36	0.36	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1977	751		1276	1276	
v/s Ratio Prot	c0.52			c0.31	0.20	
v/s Ratio Perm		0.40				
v/c Ratio	0.93	0.74		0.85	0.56	
Uniform Delay, d1	20.4	18.0		29.4	25.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	4.0		7.1	1.8	
Delay (s)	29.2	22.0		36.5	27.3	
Level of Service	C	C		D	C	
Approach Delay (s)	27.2			36.5	27.3	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	0	0	0	30	0	160	0	10	40	290
Future Volume (Veh/h)	245	0	0	0	0	30	0	160	0	10	40	290
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	245	0	0	0	0	30	0	160	0	10	40	290
Pedestrians					5							
Lane Width (m)					3.5							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	395	370	185	225	515	165	330			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395	370	185	225	515	165	330			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	55	100	100	100	100	97	100			99		
cM capacity (veh/h)	544	557	862	726	461	873	1241			1420		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	245	30	160	10	330
Volume Left	245	0	0	10	0
Volume Right	0	30	0	0	290
cSH	544	873	1241	1420	1700
Volume to Capacity	0.45	0.03	0.00	0.01	0.19
Queue Length 95th (m)	18.5	0.9	0.0	0.2	0.0
Control Delay (s)	16.9	9.3	0.0	7.6	0.0
Lane LOS	C	A		A	
Approach Delay (s)	16.9	9.3	0.0	0.2	
Approach LOS	C	A			

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		
Traffic Volume (veh/h)	1890	125	0	1790	0	0
Future Volume (Veh/h)	1890	125	0	1790	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1890	125	0	1790	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.82		0.72	0.82
vC, conflicting volume			2015		2848	1008
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1794		1642	560
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			285		67	389

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1260	755	895	895
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.74	0.44	0.53	0.53
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

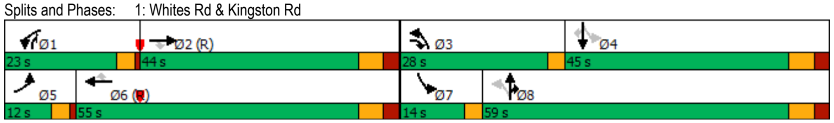
2039 Future Background Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	360	670	180	1005	360	230	460	460	165	1150	125
Future Volume (vph)	105	360	670	180	1005	360	230	460	460	165	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	11.0	41.0	70.8	18.3	48.2	48.2	71.2	52.1	73.3	53.5	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.51	0.13	0.34	0.34	0.51	0.37	0.52	0.38	0.27	0.27
v/c Ratio	0.75	0.36	0.83	0.76	0.85	0.52	0.56	0.25	0.52	0.41	0.85	0.25
Control Delay	93.3	41.2	35.0	76.3	39.9	9.6	33.3	30.8	11.4	23.7	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.3	41.2	35.0	76.3	39.9	9.6	33.3	30.8	11.4	23.7	55.0	5.6
LOS	F	D	D	E	D	A	C	C	B	C	D	A
Approach Delay		42.4			37.1			23.5			47.1	
Approach LOS		D			D			C			D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 38.0 — Intersection LOS: D
Intersection Capacity Utilization 94.1% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: Whites Rd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	360	670	180	1005	360	230	460	460	165	1150	125
Future Volume (vph)	105	360	670	180	1005	360	230	460	460	165	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	360	670	180	1005	360	230	460	460	165	1150	125
RTOR Reduction (vph)	0	0	49	0	0	194	0	0	109	0	0	91
Lane Group Flow (vph)	105	360	621	180	1005	166	230	460	351	165	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	10.0	39.9	64.7	17.3	47.2	47.2	64.7	51.1	75.5	47.5	36.9	36.9
Effective Green, g (s)	11.0	40.9	66.7	18.3	48.2	48.2	67.2	52.1	76.5	49.5	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.48	0.13	0.34	0.34	0.48	0.37	0.55	0.35	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	140	993	721	237	1181	503	406	1835	812	376	1361	400
v/s Ratio Prot	0.06	0.11	c0.16	c0.10	c0.29		0.11	0.09	0.24	0.04	c0.23	
v/s Ratio Perm			0.25			0.11	0.16			0.12		0.02
v/c Ratio	0.75	0.36	0.86	0.76	0.85	0.33	0.57	0.25	0.43	0.44	0.84	0.08
Uniform Delay, d1	63.2	39.2	32.5	58.7	42.6	34.0	30.7	30.4	18.9	32.3	48.3	38.1
Progression Factor	1.00	1.00	1.00	1.01	0.78	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	1.0	10.3	10.8	6.5	1.4	1.8	0.1	0.4	0.8	5.0	0.1
Delay (s)	83.1	40.3	42.8	70.1	39.6	36.6	32.5	30.5	19.2	33.1	53.3	38.2
Level of Service	F	D	D	E	D	D	C	C	B	C	D	D
Approach Delay (s)		45.7			42.5			26.4			49.7	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

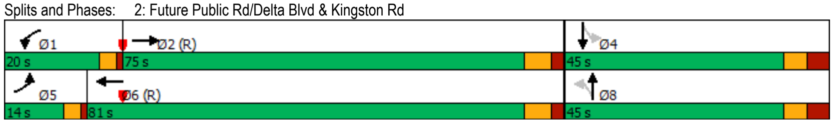
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	870	55	1425	40	0	60	10
Future Volume (vph)	95	870	55	1425	40	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	13.7	102.8	11.1	98.2	12.2	12.2		12.2
Actuated g/C Ratio	0.10	0.73	0.08	0.70	0.09	0.09		0.09
v/c Ratio	0.53	0.35	0.43	0.64	0.48	0.06		0.57
Control Delay	65.0	7.9	74.5	16.3	78.8	0.3		27.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0		0.0
Total Delay	65.0	7.9	74.5	16.5	78.8	0.3		27.8
LOS	E	A	E	B	E	A		C
Approach Delay		13.5		18.5		52.6		27.8
Approach LOS		B		B		D		C

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 88.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	870	10	55	1425	105	40	0	20	60	10	135
Future Volume (vph)	95	870	10	55	1425	105	40	0	20	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3396		1611	3429		1709	1426			3129	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.86	
Satd. Flow (perm)	1837	3396		1611	3429		965	1426			2735	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	870	10	55	1425	105	40	0	20	60	10	135
RTOR Reduction (vph)	0	0	0	0	2	0	0	18	0	0	123	0
Lane Group Flow (vph)	95	880	0	55	1528	0	40	2	0	0	82	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.7	101.0		8.9	97.2		11.2	11.2			11.2	
Effective Green, g (s)	13.7	102.0		9.9	98.2		12.2	12.2			12.2	
Actuated g/C Ratio	0.10	0.73		0.07	0.70		0.09	0.09			0.09	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	179	2474		113	2405		84	124			238	
v/s Ratio Prot	c0.05	0.26		0.03	c0.45			0.00				
v/s Ratio Perm							c0.04				0.03	
v/c Ratio	0.53	0.36		0.49	0.64		0.48	0.01			0.34	
Uniform Delay, d1	60.1	7.0		62.6	11.3		60.9	58.4			60.1	
Progression Factor	0.93	0.98		1.08	1.24		1.00	1.00			1.00	
Incremental Delay, d2	2.7	0.4		2.8	1.1		4.2	0.0			0.9	
Delay (s)	58.7	7.2		70.6	15.0		65.1	58.4			61.0	
Level of Service	E	A		E	B		E	E			E	
Approach Delay (s)		12.2			16.9			62.9			61.0	
Approach LOS		B			B			E			E	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis — Future Background 2039 AM
3: 715 & 775 Kingston Dwy/780 Kingston Dwy & Kingston Rd — 10-29-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	960	25	0	1530	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	960	25	0	1530	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	960	25	0	1530	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.88			0.91			0.93	0.93	0.91	0.93	0.93	0.88
vC, conflicting volume	1600			985			1792	2572	492	2058	2552	802
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1411			781			1250	2092	238	1536	2070	506
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	88
cM capacity (veh/h)	403			768			107	49	699	73	51	447

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	640	345	1020	575	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	699	447
Volume to Capacity	0.38	0.20	0.60	0.34	0.01	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.3
Control Delay (s)	0.0	0.0	0.0	0.0	10.2	14.2
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.2	14.2
Approach LOS					B	B

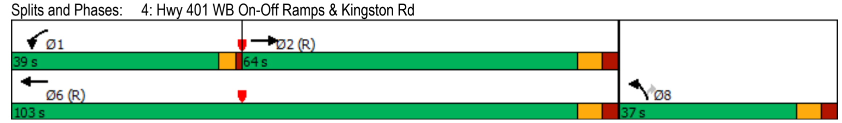
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Timings — Future Background 2039 AM
4: Hwy 401 WB On-Off Ramps & Kingston Rd — 10-29-2024

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	965	350	975	620	90
Future Volume (vph)	965	350	975	620	90
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	62.5	32.1	97.6	30.2	30.2
Actuated g/C Ratio	0.45	0.23	0.70	0.22	0.22
v/c Ratio	0.63	0.85	0.40	0.83	0.24
Control Delay	24.2	70.5	9.8	62.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	70.5	9.8	62.7	16.4
LOS	C	E	A	E	B
Approach Delay	24.2		25.9	56.8	
Approach LOS	C		C	E	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 77.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



HCM Signalized Intersection Capacity Analysis
4: Hwy 401 WB On-Off Ramps & Kingston Rd

Future Background 2039 AM
10-29-2024

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	965	5	350	975	620	90
Future Volume (vph)	965	5	350	975	620	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3431		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3431		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	965	5	350	975	620	90
RTOR Reduction (vph)	0	0	0	0	0	53
Lane Group Flow (vph)	970	0	350	975	620	37
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	61.5		31.1	96.6	29.2	29.2
Effective Green, g (s)	62.5		32.1	97.6	30.2	30.2
Actuated g/C Ratio	0.45		0.23	0.70	0.22	0.22
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1531		412	2416	746	327
v/s Ratio Prot	c0.28		c0.19	0.28	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.63		0.85	0.40	0.83	0.11
Uniform Delay, d1	29.9		51.6	8.9	52.5	44.1
Progression Factor	0.70		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9		15.0	0.5	7.8	0.2
Delay (s)	23.0		66.7	9.4	60.3	44.3
Level of Service	C		E	A	E	D
Approach Delay (s)	23.0			24.6	58.3	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

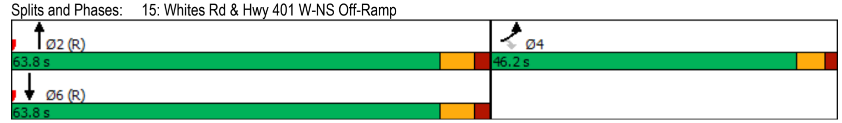
Timings
15: Whites Rd & Hwy 401 W-NS Off-Ramp

Future Background 2039 AM
10-29-2024

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	675	355	945	655
Future Volume (vph)	675	355	945	655
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	30.5	30.5	69.0	69.0
Actuated g/C Ratio	0.28	0.28	0.63	0.63
v/c Ratio	0.76	0.55	0.43	0.30
Control Delay	41.2	10.0	12.0	10.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.2	10.0	12.0	10.5
LOS	D	A	B	B
Approach Delay	31.5		12.0	10.5
Approach LOS	C		B	B

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	675	355	0	945	655	0
Future Volume (vph)	675	355	0	945	655	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3371	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3371	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	675	355	0	945	655	0
RTOR Reduction (vph)	4	194	0	0	0	0
Lane Group Flow (vph)	707	125	0	945	655	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.5	29.5		68.0	68.0	
Effective Green, g (s)	30.5	30.5		69.0	69.0	
Actuated g/C Ratio	0.28	0.28		0.63	0.63	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	934	382		2174	2195	
v/s Ratio Prot	c0.21			c0.27	0.19	
v/s Ratio Perm		0.09				
v/c Ratio	0.76	0.33		0.43	0.30	
Uniform Delay, d1	36.4	31.6		10.5	9.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.5		0.6	0.3	
Delay (s)	39.9	32.1		11.1	9.7	
Level of Service	D	C		B	A	
Approach Delay (s)	37.5			11.1	9.7	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Future Volume (vph)	30	0	0	0	0	10	0	20	0	10	5	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	30	0	0	0	0	10	0	20	0	10	5	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	30	10	20	10	30
Volume Left (vph)	30	0	0	10	0
Volume Right (vph)	0	10	0	0	25
Hadj (s)	0.20	-0.60	0.17	0.50	-0.53
Departure Headway (s)	4.2	3.5	4.3	5.1	4.1
Degree Utilization, x	0.04	0.01	0.02	0.01	0.03
Capacity (veh/h)	832	1015	818	697	863
Control Delay (s)	7.4	6.5	7.4	7.0	6.0
Approach Delay (s)	7.4	6.5	7.4	6.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	6.9		
Level of Service	A		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	975	5	0	1535	0	0
Future Volume (Veh/h)	975	5	0	1535	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	975	5	0	1535	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.92		0.80	0.92
vC, conflicting volume			980		1745	490
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			807		988	275
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			762		198	671

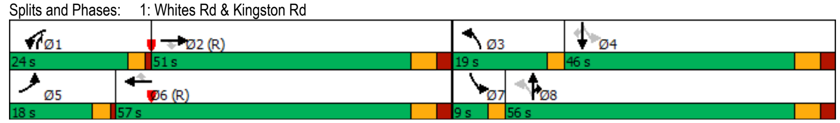
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	650	330	768	768
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.38	0.19	0.45	0.45
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	785	520	195	1020	550	375	1100	965	185	750	190
Future Volume (vph)	185	785	520	195	1020	550	375	1100	965	185	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	16.6	48.9	48.9	19.6	51.9	51.9	62.4	45.2	67.8	52.0	34.8	34.8
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.37	0.37	0.45	0.32	0.48	0.37	0.25	0.25
v/c Ratio	0.85	0.64	0.75	0.77	0.78	0.86	0.93	0.66	0.88	0.78	0.59	0.37
Control Delay	92.3	41.8	27.3	85.2	39.2	38.2	58.7	42.6	18.7	50.3	47.9	8.4
Queue Delay	0.0	1.5	0.0	0.0	0.1	0.6	0.0	0.0	1.5	0.0	0.0	0.0
Total Delay	92.3	43.4	27.3	85.2	39.4	38.9	58.7	42.6	20.2	50.3	47.9	8.4
LOS	F	D	C	F	D	D	E	D	C	D	D	A
Approach Delay		43.8			44.3			36.2			41.6	
Approach LOS		D			D			D			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 40.8	Intersection LOS: D
Intersection Capacity Utilization 114.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



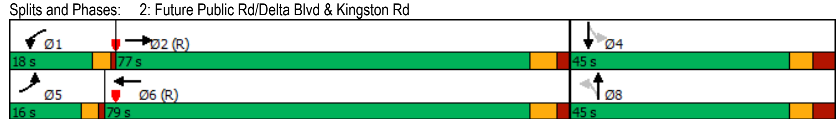
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	785	520	195	1020	550	375	1100	965	185	750	190
Future Volume (vph)	185	785	520	195	1020	550	375	1100	965	185	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.23	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	424	5129	1561	317	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	785	520	195	1020	550	375	1100	965	185	750	190
RTOR Reduction (vph)	0	0	175	0	0	84	0	0	331	0	0	135
Lane Group Flow (vph)	185	785	345	195	1020	466	375	1100	634	185	750	55
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	15.6	48.0	48.0	18.6	51.0	51.0	55.3	44.2	69.9	41.9	33.8	33.8
Effective Green, g (s)	16.6	49.0	49.0	19.6	52.0	52.0	58.3	45.2	70.9	47.9	34.8	34.8
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.37	0.37	0.42	0.32	0.51	0.34	0.25	0.25
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	217	1237	519	254	1313	554	393	1655	790	227	1262	372
v/s Ratio Prot	0.10	0.22		0.11	0.29		c0.15	0.21	c0.41	0.06	0.15	
v/s Ratio Perm			0.23			c0.31	0.25			0.21		0.04
v/c Ratio	0.85	0.63	0.67	0.77	0.78	0.84	0.95	0.66	0.80	0.81	0.59	0.15
Uniform Delay, d1	60.5	38.0	38.5	58.0	38.9	40.2	31.4	40.9	28.7	34.4	46.4	41.0
Progression Factor	1.00	1.00	1.00	1.24	0.91	0.90	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.1	2.5	6.6	8.6	3.0	9.7	33.5	1.0	5.9	19.7	0.8	0.2
Delay (s)	86.6	40.5	45.1	80.8	38.5	45.8	64.8	41.9	34.6	54.1	47.1	41.2
Level of Service	F	D	D	F	D	D	E	D	C	D	D	D
Approach Delay (s)		47.9			45.4			42.5			47.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1645	115	1500	175	20	105	15
Future Volume (vph)	125	1645	115	1500	175	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	14.1	80.7	14.0	80.6	29.4	29.4		29.4
Actuated g/C Ratio	0.10	0.58	0.10	0.58	0.21	0.21		0.21
v/c Ratio	0.68	0.83	0.63	0.80	0.85	0.33		0.42
Control Delay	77.4	24.2	72.9	29.0	84.5	11.8		22.3
Queue Delay	0.0	1.4	0.0	0.3	0.0	0.0		0.0
Total Delay	77.4	25.7	72.9	29.3	84.5	11.8		22.3
LOS	E	C	E	C	F	B		C
Approach Delay		29.2		32.3		52.1		22.3
Approach LOS		C		C		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 101.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



HCM Signalized Intersection Capacity Analysis
2: Future Public Rd/Delta Blvd & Kingston Rd

Future Background 2039 PM
10-29-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1645	45	115	1500	110	175	20	120	105	15	140
Future Volume (vph)	125	1645	45	115	1500	110	175	20	120	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.87			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3518		1837	3489		1805	1599			3154	
Flt Permitted	1.00	1.00		1.00	1.00		0.55	1.00			0.75	
Satd. Flow (perm)	1837	3518		1837	3489		990	1599			2405	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1645	45	115	1500	110	175	20	120	105	15	140
RTOR Reduction (vph)	0	1	0	0	3	0	0	95	0	0	111	0
Lane Group Flow (vph)	125	1689	0	115	1607	0	175	45	0	0	149	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.1	79.7		13.0	79.6		28.4	28.4			28.4	
Effective Green, g (s)	14.1	80.7		14.0	80.6		29.4	29.4			29.4	
Actuated g/C Ratio	0.10	0.58		0.10	0.58		0.21	0.21			0.21	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	185	2027		183	2008		207	335			505	
v/s Ratio Prot	c0.07	c0.48		0.06	0.46			0.03				
v/s Ratio Perm							c0.18				0.06	
v/c Ratio	0.68	0.83		0.63	0.80		0.85	0.13			0.30	
Uniform Delay, d1	60.7	24.2		60.5	23.4		53.1	45.0			46.6	
Progression Factor	1.09	0.81		0.99	1.04		1.00	1.00			1.00	
Incremental Delay, d2	6.0	2.7		5.5	2.9		25.8	0.2			0.3	
Delay (s)	72.0	22.3		65.7	27.1		78.9	45.1			46.9	
Level of Service	E	C		E	C		E	D			D	
Approach Delay (s)		25.7			29.7			63.9			46.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: 715 & 775 Kingston Dwy/780 Kingston Dwy & Kingston Rd

Future Background 2039 PM
10-29-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1885	15	0	1635	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1885	15	0	1635	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1885	15	0	1635	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.88			0.59			0.65	0.65	0.59	0.65	0.65	0.88
vC, conflicting volume	1735			1905			2805	3632	955	2660	3592	870
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1557			1153			1854	3119	0	1633	3058	570
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	78
cM capacity (veh/h)	376			362			24	7	644	42	8	410

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1257	643	1090	640	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	644	410
Volume to Capacity	0.74	0.38	0.64	0.38	0.05	0.22
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.2	6.6
Control Delay (s)	0.0	0.0	0.0	0.0	10.9	16.2
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		10.9	16.2
Approach LOS					B	C

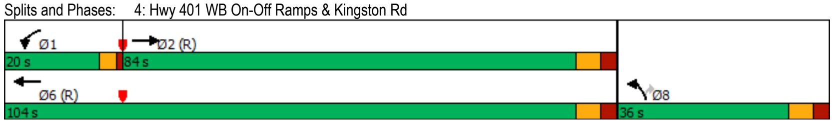
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1895	220	1020	710	300
Future Volume (vph)	1895	220	1020	710	300
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.8	18.4	98.2	32.1	29.6
Actuated g/C Ratio	0.56	0.13	0.70	0.23	0.21
v/c Ratio	0.98	0.94	0.41	0.88	0.63
Control Delay	27.5	105.0	9.4	65.1	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	105.0	9.5	65.1	23.8
LOS	C	F	A	E	C
Approach Delay	27.5		26.4	52.8	
Approach LOS	C		C	D	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 33.3 Intersection LOS: C
Intersection Capacity Utilization 97.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



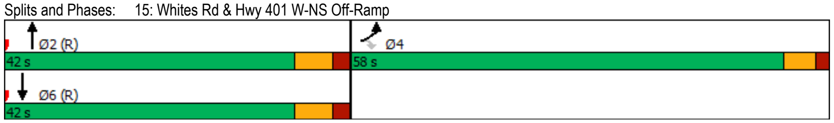
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1895	20	220	1020	710	300
Future Volume (vph)	1895	20	220	1020	710	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3529		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3529		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1895	20	220	1020	710	300
RTOR Reduction (vph)	0	0	0	0	0	153
Lane Group Flow (vph)	1915	0	220	1020	710	147
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.8		16.4	97.2	28.6	28.6
Effective Green, g (s)	77.8		18.4	98.2	32.1	29.6
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1961		234	2479	808	323
v/s Ratio Prot	c0.54		c0.12	0.29	c0.20	
v/s Ratio Perm						0.10
v/c Ratio	0.98		0.94	0.41	0.88	0.46
Uniform Delay, d1	30.2		60.3	8.8	52.1	48.2
Progression Factor	0.49		1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7		42.4	0.5	10.7	1.0
Delay (s)	26.4		102.7	9.3	62.8	49.2
Level of Service	C		F	A	E	D
Approach Delay (s)	26.4			25.8	58.7	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1705	795	1080	710
Future Volume (vph)	1705	795	1080	710
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.6	53.1	36.4	36.4
Actuated g/C Ratio	0.56	0.53	0.36	0.36
v/c Ratio	0.91	0.79	0.84	0.55
Control Delay	27.8	17.0	36.5	27.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.8	17.0	36.5	27.4
LOS	C	B	D	C
Approach Delay	24.7		36.5	27.4
Approach LOS	C		D	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 95.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1705	795	0	1080	710	0
Future Volume (vph)	1705	795	0	1080	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1705	795	0	1080	710	0
RTOR Reduction (vph)	4	159	0	0	0	0
Lane Group Flow (vph)	1781	556	0	1080	710	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	52.1	52.1		35.4	35.4	
Effective Green, g (s)	55.6	53.1		36.4	36.4	
Actuated g/C Ratio	0.56	0.53		0.36	0.36	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1967	747		1286	1286	
v/s Ratio Prot	c0.50			c0.31	0.20	
v/s Ratio Perm		0.40				
v/c Ratio	0.91	0.74		0.84	0.55	
Uniform Delay, d1	19.9	18.2		29.1	25.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.4	4.1		6.7	1.7	
Delay (s)	26.3	22.2		35.8	27.0	
Level of Service	C	C		D	C	
Approach Delay (s)	25.1			35.8	27.0	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

16: Future Public Rd & Site Dwy/715 & 775 Kingston Dwy

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Future Volume (vph)	125	0	0	0	0	30	0	160	0	10	40	95
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	125	0	0	0	0	30	0	160	0	10	40	95

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	125	30	160	10	135
Volume Left (vph)	125	0	0	10	0
Volume Right (vph)	0	30	0	0	95
Hadj (s)	0.20	-0.55	0.02	0.50	-0.47
Departure Headway (s)	4.8	4.2	4.6	5.5	4.6
Degree Utilization, x	0.17	0.04	0.20	0.02	0.17
Capacity (veh/h)	694	775	755	622	756
Control Delay (s)	8.8	7.4	8.7	7.4	7.3
Approach Delay (s)	8.8	7.4	8.7	7.3	
Approach LOS	A	A	A	A	

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

21: Kingston Rd

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1815	125	0	1780	0	0
Future Volume (Veh/h)	1815	125	0	1780	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1815	125	0	1780	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.81		0.73	0.81
vC, conflicting volume			1940		2768	970
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1699		1531	508
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			310		80	420

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1210	730	890	890
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.71	0.43	0.52	0.52
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

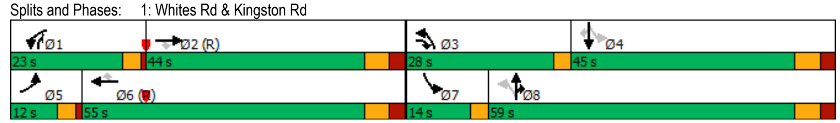
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

2039 Future Total Traffic Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	370	670	225	1050	405	230	460	485	180	1150	125
Future Volume (vph)	105	370	670	225	1050	405	230	460	485	180	1150	125
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	3	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	5.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	8.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	12.0	44.0	28.0	23.0	55.0	55.0	28.0	59.0		14.0	45.0	45.0
Total Split (%)	8.6%	31.4%	20.0%	16.4%	39.3%	39.3%	20.0%	42.1%		10.0%	32.1%	32.1%
Yellow Time (s)	3.0	4.2	3.0	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	0.0	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-2.5	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1		2.0	6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	None	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	11.0	40.4	68.8	20.2	49.6	49.6	69.8	50.3	73.5	53.9	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.49	0.14	0.35	0.35	0.50	0.36	0.52	0.38	0.27	0.27
v/c Ratio	0.75	0.38	0.85	0.86	0.86	0.56	0.59	0.26	0.55	0.45	0.85	0.25
Control Delay	93.3	41.8	37.5	91.6	43.8	13.4	34.8	31.8	13.2	24.8	55.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.3	41.8	37.5	91.6	43.8	13.4	34.8	31.8	13.2	24.8	55.0	5.6
LOS	F	D	D	F	D	B	C	C	B	C	D	A
Approach Delay		44.0			42.8			24.7			47.0	
Approach LOS		D			D			C			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 40.3	Intersection LOS: D
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



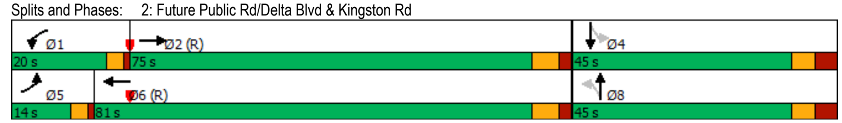
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	370	670	225	1050	405	230	460	485	180	1150	125
Future Volume (vph)	105	370	670	225	1050	405	230	460	485	180	1150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	2.0	3.0	6.0	6.0	0.5	6.1	6.1	2.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1783	3400	1514	1818	3433	1463	1818	4932	1487	1774	5029	1481
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.10	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	1783	3400	1514	1818	3433	1463	182	4932	1487	847	5029	1481
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	370	670	225	1050	405	230	460	485	180	1150	125
RTOR Reduction (vph)	0	0	50	0	0	206	0	0	102	0	0	91
Lane Group Flow (vph)	105	370	620	225	1050	199	230	460	383	180	1150	34
Confl. Peds. (#/hr)	20		5	5		20	10		20	20		10
Heavy Vehicles (%)	3%	5%	2%	1%	4%	3%	1%	4%	5%	3%	2%	3%
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2	3	1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	10.0	39.4	62.8	19.2	48.6	48.6	63.3	49.4	75.7	47.8	36.9	36.9
Effective Green, g (s)	11.0	40.4	64.8	20.2	49.6	49.6	65.8	50.4	76.7	49.8	37.9	37.9
Actuated g/C Ratio	0.08	0.29	0.46	0.14	0.35	0.35	0.47	0.36	0.55	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	3.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	140	981	700	262	1216	518	388	1775	814	380	1361	400
v/s Ratio Prot	0.06	0.11	c0.15	c0.12	c0.31		0.11	0.09	0.26	0.04	c0.23	
v/s Ratio Perm			0.26			0.14	0.17			0.13		0.02
v/c Ratio	0.75	0.38	0.89	0.86	0.86	0.38	0.59	0.26	0.47	0.47	0.84	0.08
Uniform Delay, d1	63.2	39.8	34.2	58.5	42.1	33.8	31.6	31.6	19.3	32.3	48.3	38.1
Progression Factor	1.00	1.00	1.00	1.21	0.88	1.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	1.1	12.8	17.6	6.0	1.5	2.4	0.1	0.4	0.9	5.0	0.1
Delay (s)	83.1	40.9	47.0	88.2	43.2	48.1	34.1	31.7	19.7	33.3	53.3	38.2
Level of Service	F	D	D	F	D	D	C	C	B	C	D	D
Approach Delay (s)		48.3			50.4			27.2			49.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	865	95	1425	175	0	60	10
Future Volume (vph)	95	865	95	1425	175	0	60	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	14.0	75.0	20.0	81.0	45.0	45.0	45.0	45.0
Total Split (%)	10.0%	53.6%	14.3%	57.9%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	12.3	81.4	13.9	83.0	28.8	28.8		28.8
Actuated g/C Ratio	0.09	0.58	0.10	0.59	0.21	0.21		0.21
v/c Ratio	0.59	0.47	0.59	0.75	0.80	0.34		0.35
Control Delay	74.5	19.1	67.7	31.8	78.1	1.9		17.0
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0		0.0
Total Delay	74.5	19.1	67.7	32.0	78.1	1.9		17.0
LOS	E	B	E	C	E	A		B
Approach Delay		24.2		34.1		40.5		17.0
Approach LOS		C		C		D		B

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 30.5	Intersection LOS: C
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	865	65	95	1425	105	175	0	170	60	10	135
Future Volume (vph)	95	865	65	95	1425	105	175	0	170	60	10	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85			0.90	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.99	
Satd. Flow (prot)	1837	3375		1611	3429		1709	1426			3130	
Flt Permitted	1.00	1.00		1.00	1.00		0.62	1.00			0.74	
Satd. Flow (perm)	1837	3375		1611	3429		1062	1426			2349	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	865	65	95	1425	105	175	0	170	60	10	135
RTOR Reduction (vph)	0	3	0	0	3	0	0	135	0	0	107	0
Lane Group Flow (vph)	95	927	0	95	1527	0	175	35	0	0	98	0
Confl. Peds. (#/hr)	5					5	5		5	5		5
Heavy Vehicles (%)	0%	5%	0%	14%	3%	0%	7%	0%	10%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	11.3	80.4		12.9	82.0		27.8	27.8			27.8	
Effective Green, g (s)	12.3	81.4		13.9	83.0		28.8	28.8			28.8	
Actuated g/C Ratio	0.09	0.58		0.10	0.59		0.21	0.21			0.21	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	161	1962		159	2032		218	293			483	
v/s Ratio Prot	0.05	0.27		c0.06	c0.45			0.02				
v/s Ratio Perm							c0.16				0.04	
v/c Ratio	0.59	0.47		0.60	0.75		0.80	0.12			0.20	
Uniform Delay, d1	61.4	16.9		60.4	20.9		52.9	45.3			46.1	
Progression Factor	1.00	0.99		0.91	1.30		1.00	1.00			1.00	
Incremental Delay, d2	5.1	0.7		5.0	2.2		18.8	0.2			0.2	
Delay (s)	66.2	17.5		60.2	29.5		71.7	45.5			46.3	
Level of Service	E	B		E	C		E	D			D	
Approach Delay (s)		22.0			31.2			58.8			46.3	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1105	25	0	1570	65	0	0	10	0	0	55
Future Volume (Veh/h)	0	1105	25	0	1570	65	0	0	10	0	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1105	25	0	1570	65	0	0	10	0	0	55
Pedestrians											5	
Lane Width (m)											3.3	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.88			0.85			0.91	0.91	0.85	0.91	0.91	0.88
vC, conflicting volume	1640			1130			1958	2758	565	2170	2738	822
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1448			794			1242	2121	128	1475	2099	515
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	87
cM capacity (veh/h)	388			709			106	46	767	80	48	438

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	737	393	1047	588	10	55
Volume Left	0	0	0	0	0	0
Volume Right	0	25	0	65	10	55
cSH	1700	1700	1700	1700	767	438
Volume to Capacity	0.43	0.23	0.62	0.35	0.01	0.13
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3	3.4
Control Delay (s)	0.0	0.0	0.0	0.0	9.8	14.4
Lane LOS					A	B
Approach Delay (s)	0.0		0.0		9.8	14.4
Approach LOS					A	B

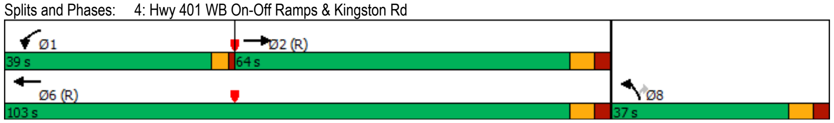
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1070	350	1010	625	90
Future Volume (vph)	1070	350	1010	625	90
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	64.0	39.0	103.0	37.0	37.0
Total Split (%)	45.7%	27.9%	73.6%	26.4%	26.4%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	6.2	3.0	6.2	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	63.3	31.9	98.2	29.6	29.6
Actuated g/C Ratio	0.45	0.23	0.70	0.21	0.21
v/c Ratio	0.72	0.85	0.42	0.85	0.24
Control Delay	17.7	71.4	9.6	65.2	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	71.4	9.7	65.2	16.8
LOS	B	E	A	E	B
Approach Delay	17.7		25.5	59.1	
Approach LOS	B		C	E	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.3 — Intersection LOS: C
Intersection Capacity Utilization 81.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1070	45	350	1010	625	90
Future Volume (vph)	1070	45	350	1010	625	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		3.0	6.2	6.0	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3417		1801	3466	3459	1516
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3417		1801	3466	3459	1516
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1070	45	350	1010	625	90
RTOR Reduction (vph)	2	0	0	0	0	53
Lane Group Flow (vph)	1113	0	350	1010	625	37
Heavy Vehicles (%)	4%	0%	2%	3%	3%	3%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	62.3		30.9	97.2	28.6	28.6
Effective Green, g (s)	63.3		31.9	98.2	29.6	29.6
Actuated g/C Ratio	0.45		0.23	0.70	0.21	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1544		410	2431	731	320
v/s Ratio Prot	c0.33		c0.19	0.29	c0.18	
v/s Ratio Perm						0.02
v/c Ratio	0.72		0.85	0.42	0.85	0.12
Uniform Delay, d1	31.2		51.8	8.8	53.1	44.6
Progression Factor	0.46		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7		15.7	0.5	9.6	0.2
Delay (s)	17.1		67.5	9.3	62.8	44.8
Level of Service	B		E	A	E	D
Approach Delay (s)	17.1			24.3	60.5	
Approach LOS	B			C	E	

Intersection Summary

HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

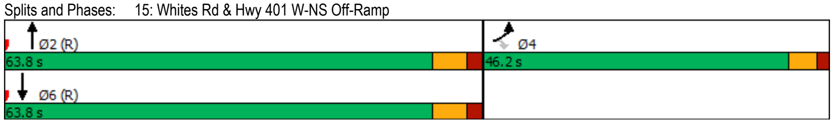
c Critical Lane Group

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	695	355	950	650
Future Volume (vph)	695	355	950	650
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	46.2	46.2	63.8	63.8
Total Split (%)	42.0%	42.0%	58.0%	58.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.6	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	31.1	31.1	68.4	68.4
Actuated g/C Ratio	0.28	0.28	0.62	0.62
v/c Ratio	0.76	0.55	0.44	0.30
Control Delay	41.0	9.7	12.4	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.0	9.7	12.4	10.8
LOS	D	A	B	B
Approach Delay	31.5		12.4	10.8
Approach LOS	C		B	B

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 79.2 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 58.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	695	355	0	950	650	0
Future Volume (vph)	695	355	0	950	650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	4.6	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3372	1379		3466	3500	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3372	1379		3466	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	695	355	0	950	650	0
RTOR Reduction (vph)	4	192	0	0	0	0
Lane Group Flow (vph)	727	127	0	950	650	0
Heavy Vehicles (%)	5%	3%	0%	3%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	30.1	30.1		67.4	67.4	
Effective Green, g (s)	31.1	31.1		68.4	68.4	
Actuated g/C Ratio	0.28	0.28		0.62	0.62	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	953	389		2155	2176	
v/s Ratio Prot	c0.22			c0.27	0.19	
v/s Ratio Perm		0.09				
v/c Ratio	0.76	0.33		0.44	0.30	
Uniform Delay, d1	36.1	31.2		10.8	9.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.5		0.7	0.4	
Delay (s)	39.7	31.7		11.5	10.0	
Level of Service	D	C		B	B	
Approach Delay (s)	37.3			11.5	10.0	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: Future Public Rd & Site Dwy/715 & 775 Kingston Dwy

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	0	0	0	0	10	0	20	0	10	5	120
Future Volume (Veh/h)	315	0	0	0	0	10	0	20	0	10	5	120
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	315	0	0	0	0	10	0	20	0	10	5	120
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	115	105	65	45	165	20	125			20		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115	105	65	45	165	20	125			20		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	63	100	100	100	100	99	100			99		
cM capacity (veh/h)	854	784	1005	957	727	1064	1474			1609		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	315	10	20	10	125
Volume Left	315	0	0	10	0
Volume Right	0	10	0	0	120
cSH	854	1064	1474	1609	1700
Volume to Capacity	0.37	0.01	0.00	0.01	0.07
Queue Length 95th (m)	13.7	0.2	0.0	0.2	0.0
Control Delay (s)	11.7	8.4	0.0	7.3	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.7	8.4	0.0	0.5	
Approach LOS	B	A			

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: Kingston Rd

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1025	5	0	1670	0	0
Future Volume (Veh/h)	1025	5	0	1670	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1025	5	0	1670	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.92		0.71	0.92
vC, conflicting volume			1030		1862	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			854		890	293
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			729		204	651

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	683	347	835	835
Volume Left	0	0	0	0
Volume Right	0	5	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.40	0.20	0.49	0.49
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

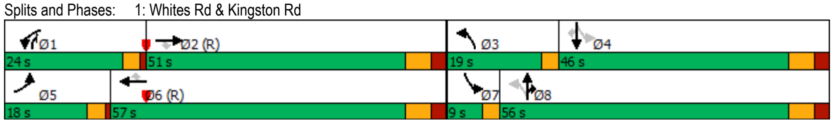
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Timings
Future Total 2039 PM
1: Whites Rd & Kingston Rd
10-29-2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	800	520	210	1025	575	375	1100	1025	215	750	190
Future Volume (vph)	185	800	520	210	1025	575	375	1100	1025	215	750	190
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	3	8	8 1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.0	43.0	43.0	9.0	43.0	43.0	8.0	44.1		8.0	44.1	44.1
Total Split (s)	18.0	51.0	51.0	24.0	57.0	57.0	19.0	56.0		9.0	46.0	46.0
Total Split (%)	12.9%	36.4%	36.4%	17.1%	40.7%	40.7%	13.6%	40.0%		6.4%	32.9%	32.9%
Yellow Time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.3		3.0	4.3	4.3
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	0.0	2.8		0.0	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-3.0	-1.0		-3.0	-1.0	-1.0
Total Lost Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1		0.0	6.1	6.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	Min		None	Min	Min
Act Effct Green (s)	15.5	46.9	46.9	20.1	51.6	51.6	64.0	47.0	70.2	54.5	37.5	37.5
Actuated g/C Ratio	0.11	0.34	0.34	0.14	0.37	0.37	0.46	0.34	0.50	0.39	0.27	0.27
v/c Ratio	0.92	0.68	0.77	0.80	0.79	0.91	0.93	0.64	0.92	0.89	0.55	0.36
Control Delay	105.6	44.0	29.4	81.3	43.9	46.2	57.7	40.9	23.9	65.6	45.4	8.2
Queue Delay	0.0	51.4	0.0	0.0	0.2	0.8	0.0	0.0	11.2	0.0	0.0	0.0
Total Delay	105.6	95.4	29.4	81.3	44.1	46.9	57.7	40.9	35.1	65.6	45.4	8.2
LOS	F	F	C	F	D	D	E	D	D	E	D	A
Approach Delay		73.9			49.3			41.0			43.0	
Approach LOS		E			D			D			D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 50.6	Intersection LOS: D
Intersection Capacity Utilization 120.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Whites Rd & Kingston Rd



HCM Signalized Intersection Capacity Analysis
Future Total 2039 PM
1: Whites Rd & Kingston Rd
10-29-2024

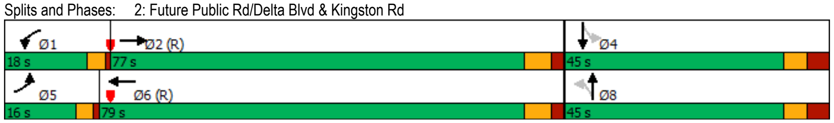
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	800	520	210	1025	575	375	1100	1025	215	750	190
Future Volume (vph)	185	800	520	210	1025	575	375	1100	1025	215	750	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	0.0	6.1	6.1	0.0	6.1	6.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1837	3535	1483	1818	3535	1492	1834	5129	1561	1818	5079	1499
Flt Permitted	1.00	1.00	1.00	1.00	1.00	1.00	0.24	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1837	3535	1483	1818	3535	1492	448	5129	1561	322	5079	1499
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	800	520	210	1025	575	375	1100	1025	215	750	190
RTOR Reduction (vph)	0	0	175	0	0	84	0	0	320	0	0	132
Lane Group Flow (vph)	185	800	345	210	1025	491	375	1100	705	215	750	58
Confl. Peds. (#/hr)	20		25	25		20	25		15	15		25
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pt+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	14.5	45.9	45.9	19.1	50.5	50.5	56.9	46.0	72.2	44.4	36.5	36.5
Effective Green, g (s)	15.5	46.9	46.9	20.1	51.5	51.5	59.9	47.0	73.2	50.4	37.5	37.5
Actuated g/C Ratio	0.11	0.33	0.33	0.14	0.37	0.37	0.43	0.34	0.52	0.36	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	3.0	7.1		3.0	7.1	7.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	203	1184	496	261	1300	548	393	1721	816	232	1360	401
v/s Ratio Prot	0.10	0.23		0.12	0.29		c0.14	0.21	c0.45	0.07	0.15	
v/s Ratio Perm			0.23			c0.33	0.27			0.26		0.04
v/c Ratio	0.91	0.68	0.70	0.80	0.79	0.90	0.95	0.64	0.86	0.93	0.55	0.15
Uniform Delay, d1	61.6	40.0	40.4	58.0	39.4	41.7	30.3	39.3	29.1	34.9	44.0	39.0
Progression Factor	1.00	1.00	1.00	1.16	1.03	1.04	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.3	3.1	7.8	10.0	2.9	12.8	33.5	0.8	9.4	39.1	0.5	0.2
Delay (s)	100.9	43.1	48.2	77.4	43.4	56.1	63.7	40.1	38.5	74.0	44.5	39.2
Level of Service	F	D	D	E	D	E	E	D	D	E	D	D
Approach Delay (s)		52.0			51.4			43.0			49.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	120.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	1650	195	1500	220	20	105	15
Future Volume (vph)	125	1650	195	1500	220	20	105	15
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.0	31.9	9.0	31.9	45.0	45.0	45.0	45.0
Total Split (s)	16.0	77.0	18.0	79.0	45.0	45.0	45.0	45.0
Total Split (%)	11.4%	55.0%	12.9%	56.4%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.0	4.7	3.0	4.7	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.2	1.0	2.2	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	7.0	7.0		7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	13.0	72.6	17.5	77.1	34.0	34.0		34.0
Actuated g/C Ratio	0.09	0.52	0.12	0.55	0.24	0.24		0.24
v/c Ratio	0.74	0.99	0.85	0.84	0.90	0.39		0.40
Control Delay	82.1	43.1	84.6	34.0	87.0	11.0		21.0
Queue Delay	0.0	35.5	0.0	0.4	0.0	0.0		0.0
Total Delay	82.1	78.6	84.6	34.3	87.0	11.0		21.0
LOS	F	E	F	C	F	B		C
Approach Delay		78.8		39.8		50.8		21.0
Approach LOS		E		D		D		C

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 56.7	Intersection LOS: E
Intersection Capacity Utilization 111.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Future Public Rd/Delta Blvd & Kingston Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1650	145	195	1500	110	220	20	180	105	15	140
Future Volume (vph)	125	1650	145	195	1500	110	220	20	180	105	15	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3	3.3	3.5	3.3
Total Lost time (s)	3.0	5.9		3.0	5.9		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86			0.92	
Flt Protected	1.00	1.00		1.00	1.00		1.00	1.00			0.98	
Satd. Flow (prot)	1837	3483		1837	3489		1804	1590			3155	
Flt Permitted	1.00	1.00		1.00	1.00		0.56	1.00			0.69	
Satd. Flow (perm)	1837	3483		1837	3489		1013	1590			2216	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	125	1650	145	195	1500	110	220	20	180	105	15	140
RTOR Reduction (vph)	0	4	0	0	4	0	0	129	0	0	106	0
Lane Group Flow (vph)	125	1791	0	195	1606	0	220	71	0	0	154	0
Confl. Peds. (#/hr)	10		5	5		10	10		5	5		10
Heavy Vehicles (%)	0%	1%	2%	0%	1%	0%	1%	6%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.0	71.6		16.5	76.1		33.0	33.0			33.0	
Effective Green, g (s)	13.0	72.6		17.5	77.1		34.0	34.0			34.0	
Actuated g/C Ratio	0.09	0.52		0.12	0.55		0.24	0.24			0.24	
Clearance Time (s)	4.0	6.9		4.0	6.9		8.0	8.0			8.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	170	1806		229	1921		246	386			538	
v/s Ratio Prot	0.07	c0.51		c0.11	0.46			0.04				
v/s Ratio Perm							c0.22				0.07	
v/c Ratio	0.74	0.99		0.85	0.84		0.89	0.18			0.29	
Uniform Delay, d1	61.8	33.4		60.0	26.2		51.3	42.0			43.1	
Progression Factor	1.10	0.87		0.96	1.10		1.00	1.00			1.00	
Incremental Delay, d2	8.7	13.8		21.2	3.7		30.9	0.2			0.3	
Delay (s)	76.5	42.7		78.9	32.6		82.2	42.2			43.4	
Level of Service	E	D		E	C		F	D			D	
Approach Delay (s)		44.9			37.6			63.2			43.4	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1950	15	0	1715	95	0	0	30	0	0	90
Future Volume (Veh/h)	0	1950	15	0	1715	95	0	0	30	0	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	1950	15	0	1715	95	0	0	30	0	0	90
Pedestrians								5			5	
Lane Width (m)								3.3			3.3	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		134			134							
pX, platoon unblocked	0.86			0.50			0.56	0.56	0.50	0.56	0.56	0.86
vC, conflicting volume	1815			1970			2910	3778	988	2772	3738	910
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1627			921			1749	3288	0	1505	3217	579
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	94	100	100	77
cM capacity (veh/h)	348			370			24	5	538	45	6	398

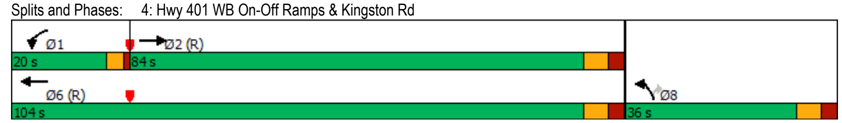
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1300	665	1143	667	30	90
Volume Left	0	0	0	0	0	0
Volume Right	0	15	0	95	30	90
cSH	1700	1700	1700	1700	538	398
Volume to Capacity	0.76	0.39	0.67	0.39	0.06	0.23
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.4	6.9
Control Delay (s)	0.0	0.0	0.0	0.0	12.1	16.7
Lane LOS					B	C
Approach Delay (s)	0.0		0.0		12.1	16.7
Approach LOS					B	C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1950	220	1090	720	300
Future Volume (vph)	1950	220	1090	720	300
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	9.0	49.2	36.0	36.0
Total Split (s)	84.0	20.0	104.0	36.0	36.0
Total Split (%)	60.0%	14.3%	74.3%	25.7%	25.7%
Yellow Time (s)	4.2	3.0	4.2	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-2.0	-1.0	-3.5	-1.0
Total Lost Time (s)	6.2	2.0	6.2	3.5	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Min	None	C-Min	None	None
Act Effct Green (s)	77.8	18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56	0.13	0.70	0.23	0.21
v/c Ratio	1.01	0.94	0.44	0.89	0.63
Control Delay	30.9	106.2	9.8	66.0	24.1
Queue Delay	2.8	0.0	0.1	0.0	0.0
Total Delay	33.7	106.2	9.8	66.0	24.1
LOS	C	F	A	E	C
Approach Delay	33.7		26.0	53.7	
Approach LOS	C		C	D	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 36.1	Intersection LOS: D
Intersection Capacity Utilization 100.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Hwy 401 WB On-Off Ramps & Kingston Rd



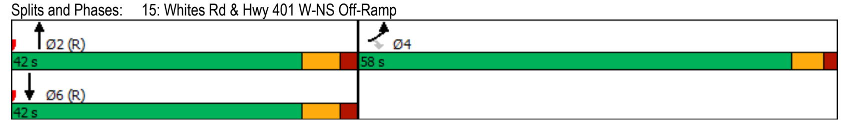
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1950	30	220	1090	720	300
Future Volume (vph)	1950	30	220	1090	720	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.3	3.3	3.5	3.3	3.3
Total Lost time (s)	6.2		2.0	6.2	3.5	6.0
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		1.00	1.00	1.00	1.00
Satd. Flow (prot)	3527		1783	3535	3528	1531
Flt Permitted	1.00		1.00	1.00	1.00	1.00
Satd. Flow (perm)	3527		1783	3535	3528	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1950	30	220	1090	720	300
RTOR Reduction (vph)	1	0	0	0	0	151
Lane Group Flow (vph)	1979	0	220	1090	720	149
Confl. Peds. (#/hr)						5
Heavy Vehicles (%)	1%	0%	3%	1%	1%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	76.8		16.3	97.1	28.7	28.7
Effective Green, g (s)	77.8		18.3	98.1	32.2	29.7
Actuated g/C Ratio	0.56		0.13	0.70	0.23	0.21
Clearance Time (s)	7.2		4.0	7.2	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1960		233	2477	811	324
v/s Ratio Prot	c0.56		c0.12	0.31	c0.20	
v/s Ratio Perm						0.10
v/c Ratio	1.01		0.94	0.44	0.89	0.46
Uniform Delay, d1	31.1		60.3	9.1	52.2	48.1
Progression Factor	0.42		1.00	1.00	1.00	1.00
Incremental Delay, d2	16.3		43.3	0.6	11.5	1.0
Delay (s)	29.3		103.7	9.6	63.7	49.2
Level of Service	C		F	A	E	D
Approach Delay (s)	29.3			25.4	59.4	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	1765	795	1080	710
Future Volume (vph)	1765	795	1080	710
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	8.0	8.0	20.0	20.0
Minimum Split (s)	29.6	29.6	28.9	28.9
Total Split (s)	58.0	58.0	42.0	42.0
Total Split (%)	58.0%	58.0%	42.0%	42.0%
Yellow Time (s)	3.8	3.8	4.6	4.6
All-Red Time (s)	1.8	1.8	2.3	2.3
Lost Time Adjust (s)	-3.5	-1.0	-1.0	-1.0
Total Lost Time (s)	2.1	4.6	5.9	5.9
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	55.9	53.4	36.1	36.1
Actuated g/C Ratio	0.56	0.53	0.36	0.36
v/c Ratio	0.93	0.79	0.85	0.56
Control Delay	30.5	16.9	37.0	27.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.5	16.9	37.0	27.6
LOS	C	B	D	C
Approach Delay	26.7		37.0	27.6
Approach LOS	C		D	C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 29.4	Intersection LOS: C
Intersection Capacity Utilization 96.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Whites Rd & Hwy 401 W-NS Off-Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1765	795	0	1080	710	0
Future Volume (vph)	1765	795	0	1080	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.3	3.3	3.5	3.5	3.3
Total Lost time (s)	2.1	4.6		5.9	5.9	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.99	0.85		1.00	1.00	
Flt Protected	1.00	1.00		1.00	1.00	
Satd. Flow (prot)	3538	1407		3535	3535	
Flt Permitted	1.00	1.00		1.00	1.00	
Satd. Flow (perm)	3538	1407		3535	3535	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1765	795	0	1080	710	0
RTOR Reduction (vph)	3	158	0	0	0	0
Lane Group Flow (vph)	1842	557	0	1080	710	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	52.4	52.4		35.1	35.1	
Effective Green, g (s)	55.9	53.4		36.1	36.1	
Actuated g/C Ratio	0.56	0.53		0.36	0.36	
Clearance Time (s)	5.6	5.6		6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1977	751		1276	1276	
v/s Ratio Prot	c0.52			c0.31	0.20	
v/s Ratio Perm		0.40				
v/c Ratio	0.93	0.74		0.85	0.56	
Uniform Delay, d1	20.3	18.0		29.4	25.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	4.0		7.1	1.8	
Delay (s)	28.9	22.0		36.5	27.3	
Level of Service	C	C		D	C	
Approach Delay (s)	27.0			36.5	27.3	
Approach LOS	C			D	C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	0	0	0	0	30	0	160	0	10	40	275
Future Volume (Veh/h)	230	0	0	0	0	30	0	160	0	10	40	275
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	230	0	0	0	0	30	0	160	0	10	40	275
Pedestrians					5							
Lane Width (m)					3.5							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											73	
pX, platoon unblocked												
vC, conflicting volume	388	362	178	225	500	165	315			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	388	362	178	225	500	165	315			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	58	100	100	100	100	97	100			99		
cM capacity (veh/h)	550	562	871	726	470	873	1257			1420		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	230	30	160	10	315
Volume Left	230	0	0	10	0
Volume Right	0	30	0	0	275
cSH	550	873	1257	1420	1700
Volume to Capacity	0.42	0.03	0.00	0.01	0.19
Queue Length 95th (m)	16.4	0.9	0.0	0.2	0.0
Control Delay (s)	16.2	9.3	0.0	7.6	0.0
Lane LOS	C	A		A	
Approach Delay (s)	16.2	9.3	0.0	0.2	
Approach LOS	C	A			

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		
Traffic Volume (veh/h)	1920	125	0	1825	0	0
Future Volume (Veh/h)	1920	125	0	1825	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1920	125	0	1825	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	100			120		
pX, platoon unblocked			0.81		0.71	0.81
vC, conflicting volume			2045		2895	1022
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1815		1618	545
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			276		68	393

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	1280	765	912	912
Volume Left	0	0	0	0
Volume Right	0	125	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.75	0.45	0.54	0.54
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		